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COMPARATIVE STUDY OF GEOSTATISTICAL GRADE CONTROL AND CLASSICAL APPROACH - IRON ORE PROCESSING

Final Report

by

Geostat Systems International Inc.

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MICROMEDIA

SUMMARY

Early attempts in the application of geostatistical techniques for grade estimation of the iron ore deposits in the Labrador Trough failed mostly because the complex structural geology of these deposits was not really taken into account. The purpose of the study presented in this report is to develop new geostatistical methods that would provide better estimates of blast grades, hence a better control of mill feed grade variability.

The zone which has been used as a test case is the north part of the main pit of the Mt Wright operation. After defining a standard stratigraphy for that zone, we digitized the limits of folded layers on cross-sections 150m apart. Then we defined a new coordinate system for any point (sample, part of a block) in the zone with a «strike» coordinate perpendicular to sections, a down-dip coordinate along folds on sections and a stratigraphic coordinate along true thickness of layers. Standard geostatistical manipulations (variogram computation, block kriging) were all carried in the new coordinate system.

Kriging results were compared to actual blast data and the agreement was found satisfactory (difference of 3% Fe or less) in 8 blasts out of 9 studied.

We also studied the precision of blast hole sampling and found

that assaying % Fe and weight recovery in one blast hole every eight (assuming a 8 x 8m grid) was sufficient to get a reasonably accurate estimate of the blast ore grade.

RESUME

Dans le passé, des essais d'application des méthodes géostatistiques à l'estimation des teneurs des gisements de fer de la fosse du Labrador se sont révélés infructueux car on ne tenait pas compte de la complexité structurale de ces gisements. Le but de l'étude présentée dans ce rapport est de mettre au point une nouvelle méthode géostatistique pour générer des estimés de teneurs de sautages plus précis et réduire ainsi les problèmes de fluctuations de teneurs au moulin.

La zone utilisée pour les fins de cette étude est la partie nord de la carrière principale de la mine de Mt Wright. Après avoir défini une colonne stratigraphique standard pour cette zone, nous avons digitalisé les limites des couches plissées sur des sections à 150m de distance. Par la suite, nous avons défini un nouveau système de coordonnées pour n'importe quel point (échantillon ou portion de bloc) dans la zone. Ce système comprend une coordonnée «d'allongement» perpendiculaire aux sections, une coordonnée «de plongée» le long des plis sur les sections et une coordonnée «stratigraphique» le long de l'axe des épaisseurs vraies des couches. Les calculs géostatistiques habituels (variogrammes, krigeage de blocs) furent tous accomplis dans le nouveau système de coordonnées. Les résultats du krigeage ont été comparés avec les données réelles de sautages et les résultats sont satisfaisants: les différences de teneur sont de moins de 3% Fe dans 8 cas sur 9.

Nous avons aussi étudié la précision de l'échantillonnage d'un

sautage et nous avons déterminé qu'il suffisait d'analyser le fer total et la récupération en poids dans un trou de tir sur huit pour obtenir un estimé suffisamment précis des teneurs moyennes du sautage.

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1 - BACKGROUND INFORMATION

The original statement of work for this study stated that the objective would be to develop and apply geostatistical techniques to better control uniformity of iron ore grades and alleviate milling problems due to ore variability. Quebec Cartier Mining, which operates the Mt Wright open pit mine at Fermont, in northern Quebec, close to Labrador, was willing to provide exploration and production data for this study.

The Mt Wright deposit corresponds to several syncline structures affecting a highly metamorphosed sedimentary sequence of banded iron formations (specular hematite and quartz) and quartzite between a lower and an upper gneiss. Amphibolite is found intruding the sequence. The axis planes of the syncline structures are dipping about 45° to the SE.

The deposit has been explored by BQ drill holes on NW-SE sections 150m apart. Spacing of drill holes on sections is also about 150m. In some places, in-fill drilling has been done. Most of the drill holes are dipping about 55° to the NW to cut ore structures perpendicularly. A total of about 320000 ft has been drilled.

Every 20ft interval in ore along drill holes is assayed

for % Fe total and weight recovery. Starting in the summer of 84, cores have been reassayed for other elements including manganese and titanium.

Weight recovery characterizes the performance of the spirals in concentrating the ore. Formula used is:

Tonnes of concentrate = volume of ore x ARL factor x weight recovery

The ARL factor converts m^3 in tonnes as a function of % Fe total. ARL values are read from a table.

There are no hardness, grindability or % magnetite data available from drill hole samples on a systematic basis.

Geology has been interpreted on the cross-sections 150m apart. There are about 30 of them across the deposit. Bands of ore with homogeneous grade have been defined and correlated from one hole to the next. Along these bands, blocks of constant % Fe and weight recovery have been defined by fixing a limit halfway between one drill hole and the next. Block limits are put back on bench maps and correlation from one section to the next is performed. The bench maps with their limits of blocks with constant grade and weight recovery are really the basis for ore reserve estimation: given the limits of a blast (or blocks on a regular grid), it is easy to use the block limits in the same bench to predict the reserves of that blast in terms of head grade and tonnes of concentrate.

Quebec Cartier Mining currently operates three different pits in the Mt Wright deposit: to the south, the Mt Wright pit; to the southwest the South Hill pit and to the North, the Paul's Peak pit by far the largest of the three. This study is just dealing with that part of the orebody exposed or to be mined in this latter pit. Benches are 14m high. Mining is done with 16yd^3 shovels and 150 tons trucks.

Basically, material in the pits is divided in four main categories: (1) waste which might be either gneiss, quartzite or amphibolite, (2) low grade ore with total iron between 15 and 25%, (3) medium grade ore with total iron between 25 and 35%, (4) high grade ore with total iron about 35%.

In the pits, blast size is generally somewhere between 100,000m^3 and 150,000m^3 for about 10 days production. Until very recently, only one or two composite blast samples were assayed for % Fe total and weight recovery in the ore portion of each blast and reported together with blast limits and geology on foremen's sheets. Starting in the fall of 1984, a more systematic blast hole sampling procedure has been established. In that case, about 20 to 30 blast holes are assayed on a somewhat systematic grid. Assays are % Fe total but also magnetite, TiO_2 and MnO.

2. GEOLOGICAL MODELLING

2.1 Introduction

The estimation of variables like %Fe and weight recovery in deposits made of folded strata presents one major problem, the spatial distribution of the variable is distorted by the posterior folding of the originally flat layers of the iron formation.

The geological information coming from drill holes is located in space with a cartesian system of coordinates that does not respect the folded aspect of the strata. For example, the distance between samples S1 and S2 coming from the same stratum in two different holes is usually the cartesian distance. The cartesian system

$$\sqrt{(X_2-X_1)^2 + (Y_2-Y_1)^2 + (Z_2-Z_1)^2}$$

used is today's system. However this distance does not reflect the original distance between the two samples at the time of the formation (see Figure 2.1).

The main effect of that is that the spatial distribution of the samples being distorted masks true relationship between the samples. The variograms are distorted and the estimation process is biased by «false» distance between the estimated block and the samples around.

What is needed is a way to «unfold» the strata or more

precisely put the samples back to their original position.

A method has been developed to «unfold» the strata. First, we have to define a stratigraphic column which is applicable to the area under study. Then, the method simply reproduces what the geologist would do to compute the stratigraphic position of a point:

1 - locate visually the stratum that contains the point

2 - evaluate its relative position in the stratum between the footwall and the hangingwall

3 - evaluate its relative position along the stratum from a known fixed point (like the axis of a fold)

The flowchart presented in Figure 2.2 shows the major steps of the process of creating an «unfolded» geological model. The next sections of Chapter 2 explain each step in details.

2.2 Definition of a stratigraphic column and interpretation of the geology on sections

The geologist must first define a stratigraphic column that is representative of the entire area being examined. Most of layers in the stratigraphic column should appear in the sections with some exceptions. For example, if a layer only appears in one section and is similar to an adjacent layer,

the two would be grouped together. In other words, similar layers are grouped together, specially the waste layers: as we do not estimate material in waste all the contiguous waste layers are grouped together even if they are of different rock types. On the other hand, the ore (or potential ore) should always reflect the differences in mineralization characteristics. One should always avoid excess detail.

Table 1 presents the stratigraphic column chosen for this study. It consists of 11 layers, 3 of which, are ore layers (layer 5, 7 and 9).

One must always remember, when interpreting the geology on the sections, that there should not be any gaps in the sequence of layers. By this we mean that if for some reason layer 4 does not exist in section 3750, that layer should still be present in the section but drawn to coincide with the next existing layer (layer 5 in this example). This very minor restriction comes from the way the unfolding program UNFOLD expects the stratigraphic database structure to be (see Figure 2.3a).

Another point to be careful about when interpreting the geology is that if a layer is present, it must be present all over the section. That is, if a layer disappears and then reappears further (like on the other

side of a fold) the two parts should be connected with a portion of the layer having a thickness of zero (see Figure 2.3b).

The last point of importance is that the portion of the layers that has been eroded (above the surface) must be reconstituted as accurately as possible. This again is to respect the longitudinal distance between two samples when the layer that contains the samples has an eroded portion between the samples (see Figure 2.3c).

2.3 Digitizing of geology model

The modelled geology has to be put in a form that is understandable by a computer program. In other words, we have to transform all the lines drawn on the section plans into a sequence of point coordinates forming the lines. This process is called digitizing. This has to be done for each layer in every section. This can seem a huge task but since it can be done using a device called digitizer, the process is highly simplified. By just moving the digitizer cursor over the line while pressing the button regularly, the digitizer transmits to the computer the X-Y coordinates of the points located where the button has been depressed.

The program DIGIT provides an interface between

Layer number	Rock type	Ore/Waste
11	Graphite gneiss (GG)	WASTE
10	Amphibolite (AMP) or Quartz Micaschist (QRMS)	
9	Iron formation (HIF, HMIF, LHIF)	ORE
8	Amphibolite (AMP) or Quartz Micaschist (QRMS)	WASTE
7	Iron formation (HIF, HMIF, LHIF)	ORE
6	Amphibolite (AMP) or Quartz Micaschist (QRMS)	WASTE
5	Iron formation (HIF, HMIF, LHIF)	ORE
4	Amphibolite (AMP) or quartz Micaschist (QRMS)	WASTE
3	Quartz Micaschist (QRMS)	
2	Amphibolite (AMP)	
1	Quartz Micaschist (QRMS)	
	Basal Gneiss (BG)	

Table 1: Simplified stratigraphic column for the north part of the Mt Wright pit (section 3000 to 4500N). HIF is hematite iron formation, HMIF is hematite-magnetite iron formation and LHIF is limonite-hematite iron formation.

data sent from the digitizer and the file containing the layers information. The file then consists of, for each section and each layer, a header and a series of coordinate pairs which when linked together form the layers. Refer to the information on the program DIGIT in Appendix I for more information.

Once digitized, the modelled geology can be plotted on section plans together with the drill holes. Figures 2.4 to 2.11 show the sections 3000 to 4050, the sections being 150m apart.

2.4 Unfolding the layers

The term unfolding here does not mean physically unfolding the layers on a plan, but computing the stratigraphic coordinates of a point in an unfolded environment.

The stratigraphic position of a point or a sample is defined by:

1.- the layer number the sample belongs to

2 - the relative position in the layer in terms of percentage (0% the sample is at the bottom, 99.99% the sample is at the top). For example if a sample has a coordinate of 745.30 that means that the sample belongs to layer 7 and it is at

45.3% distance from the bottom of the layer

3 - the relative position along the layer from a known point of reference. That point can be the axis of a fold. It should be a point common to all sections since it becomes the origin of the axis. The coordinate is then the unfolded distance between the point and the origin. If the point is to the left of the origin, the coordinate (or distance) is negative.

The unfolded coordinate system is now:

1 - Xu: coordinate of the point along the layer

2 - Yu: coordinate of the point across the layer

Refer to Figure 2-12.

The way the geologist models the layers is very important specially when portions of layers are missing. The coordinate Xu along the layer must still reflect the presence of eroded portions of a layer as if they still existed.

In Figures 2.13 to 2.20, we show sections 3000 to 4050 once unfolded. The layers become flat with equal thickness over all the layers since the thickness is artificial and equal to 100 (100%). Note that the pattern

made by the samples reproduce more or less the fold pattern but inverted. This unfolded coordinate system is now «cartesian» and any further computation will be done using unfolded coordinates (variograms, kriging).

Program UNFOLD was developed and used to unfold the geology. One will find the documentation relative to this program in appendix.

On all the sections of unfolded layers (Figures 2.13 to 2.20) one can see that most of the drill hole samples are concentrated in the ore layers i.e. between 500 and 600, 700 and 800 and 900 and 1000.

Also, it appears on these sections that drill holes are crossing layers in an oblique way whereas they seemed to enter layers rather perpendicularly on the original sections (Figures 2.4 to 2.11). That means that the Xu coordinate of the intercept of a hole with the hanging-wall of a layer is different from the Xu coordinate of the intercept of the same drill hole with the foot-wall of the same layer. Now the reason for that discrepancy lies in the deformation that exists between the footwall and the hangingwall of a layer when it is folded: footwall is extended and hangingwall is compressed. Then a coefficient («extension or compression factor») could apply to the Xu coordinates as they are computed

right now (straight distance along layers) and this coefficient would be a function of the Xu coordinate of the same point.

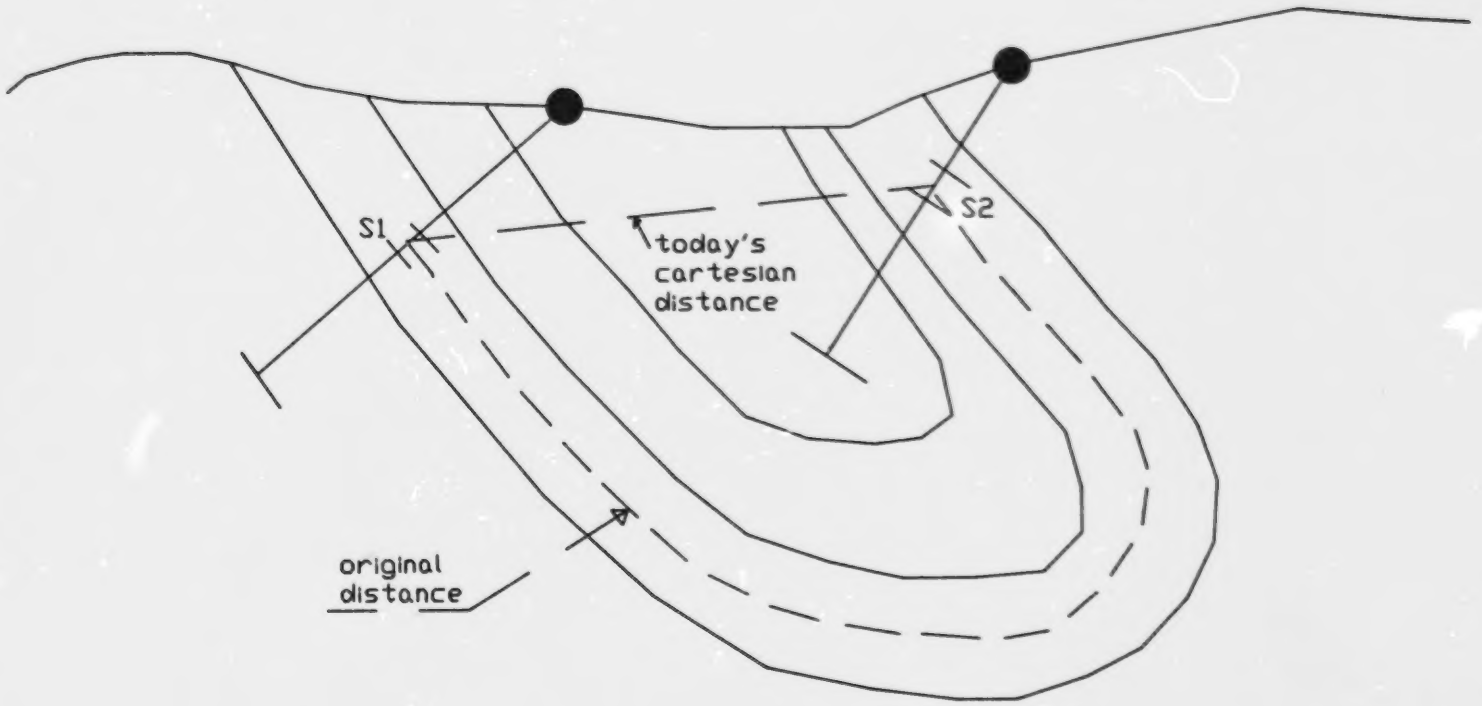

figure 2.1 : Interpreted distance between two samples in folded strata

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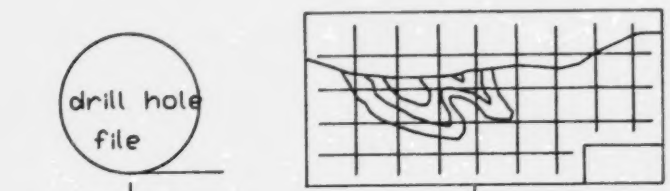
figure 2.2 Flowchart of the process of 'unfolding' strata



drill hole file

compositing

samples file

digitizing program DIGIT

unfolding process program UNFOLD

unfolded samples file

The stratigraphic column is established and the geology is interpreted on each section

The geology is put in a form usable by the computer

The stratigraphy coordinates of each sample are computed

1- its position in the stratum (relative to the footwall)
2- its position along the stratum (relative to the point of reference (axis of a fold)

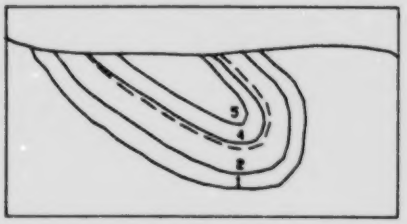


figure 2.3a : Geological modelling of a missing layer

The dashed line represents layer #2-layer #3 contact. Note that layer 3 has no thickness which is equivalent to a missing layer

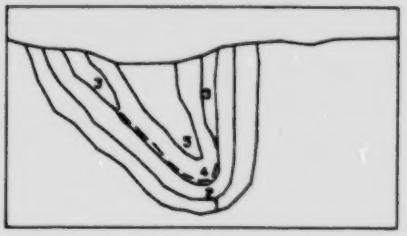


figure 2.3b : Geological modelling of a discontinued layer

The dashed line represents the continuation of the layer3-layer4 contact.

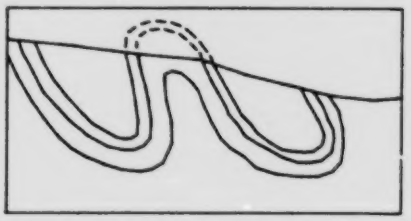


figure 2.3c : Geological modelling of the eroded portion of a strata

The curvature should follow the most likely folding as accurately as possible

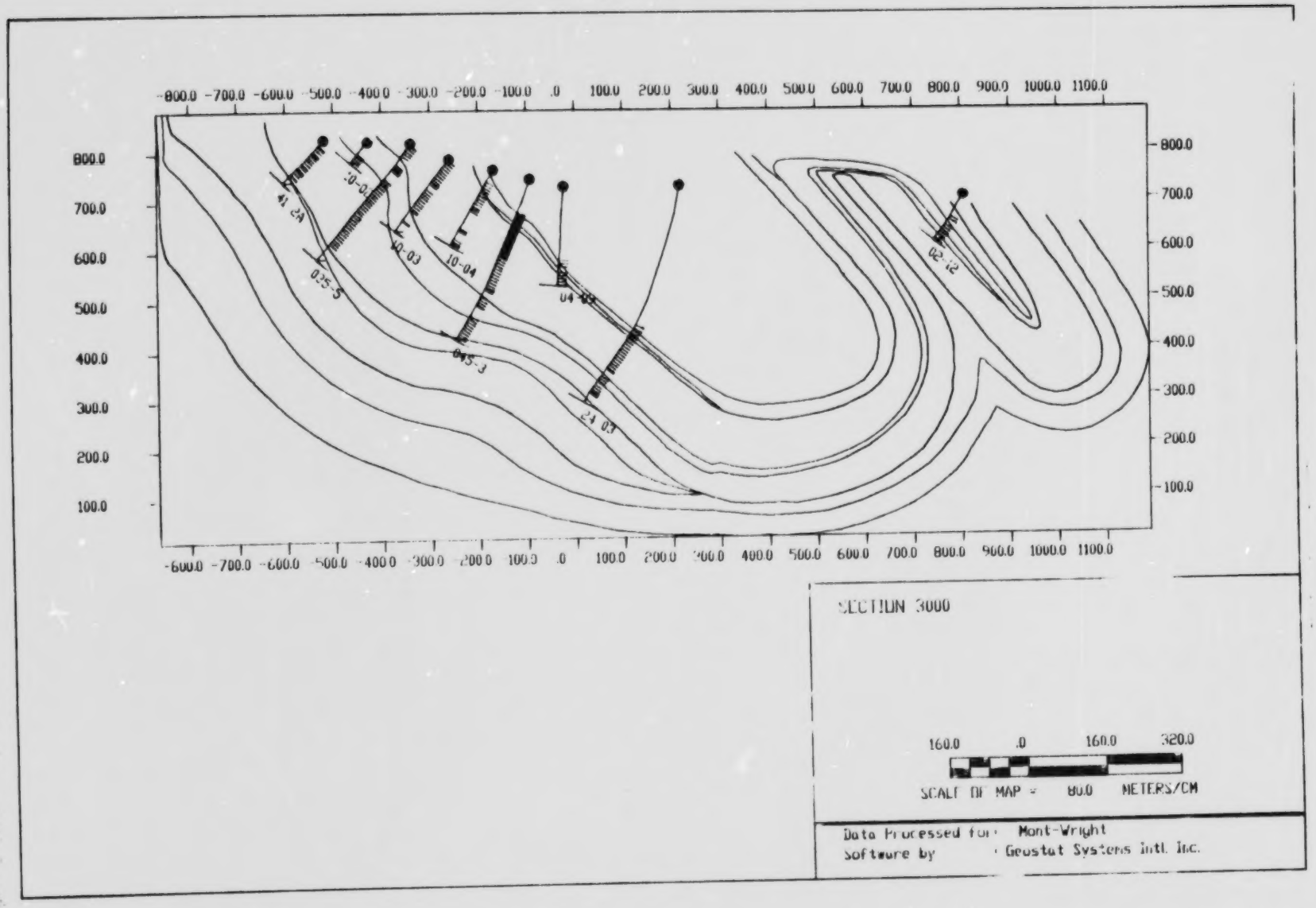


Figure 2.4: Interpreted section 3000 with drill hole profiles.

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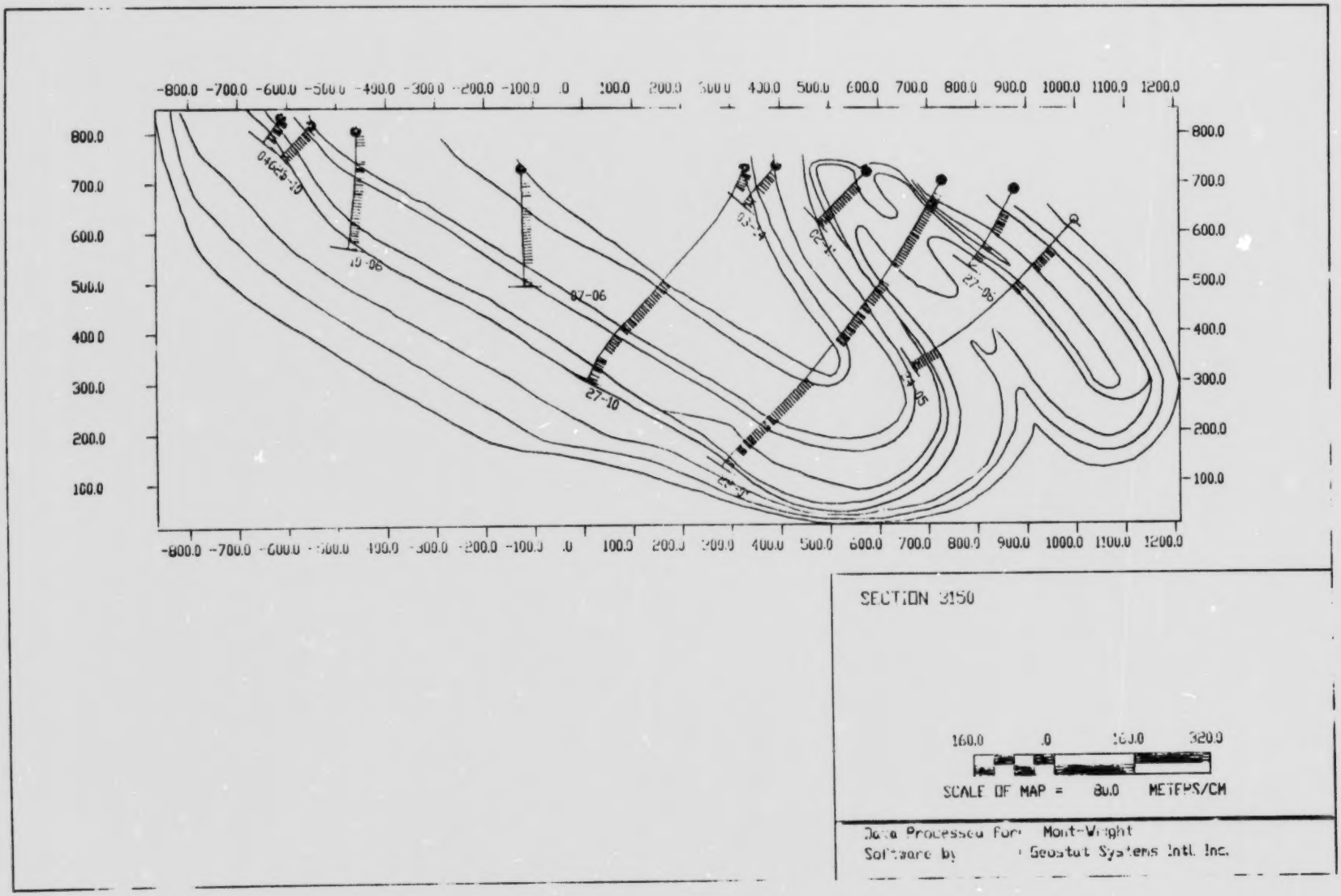

Figure 2.5: Interpreted section 3150 with drill hole profiles.

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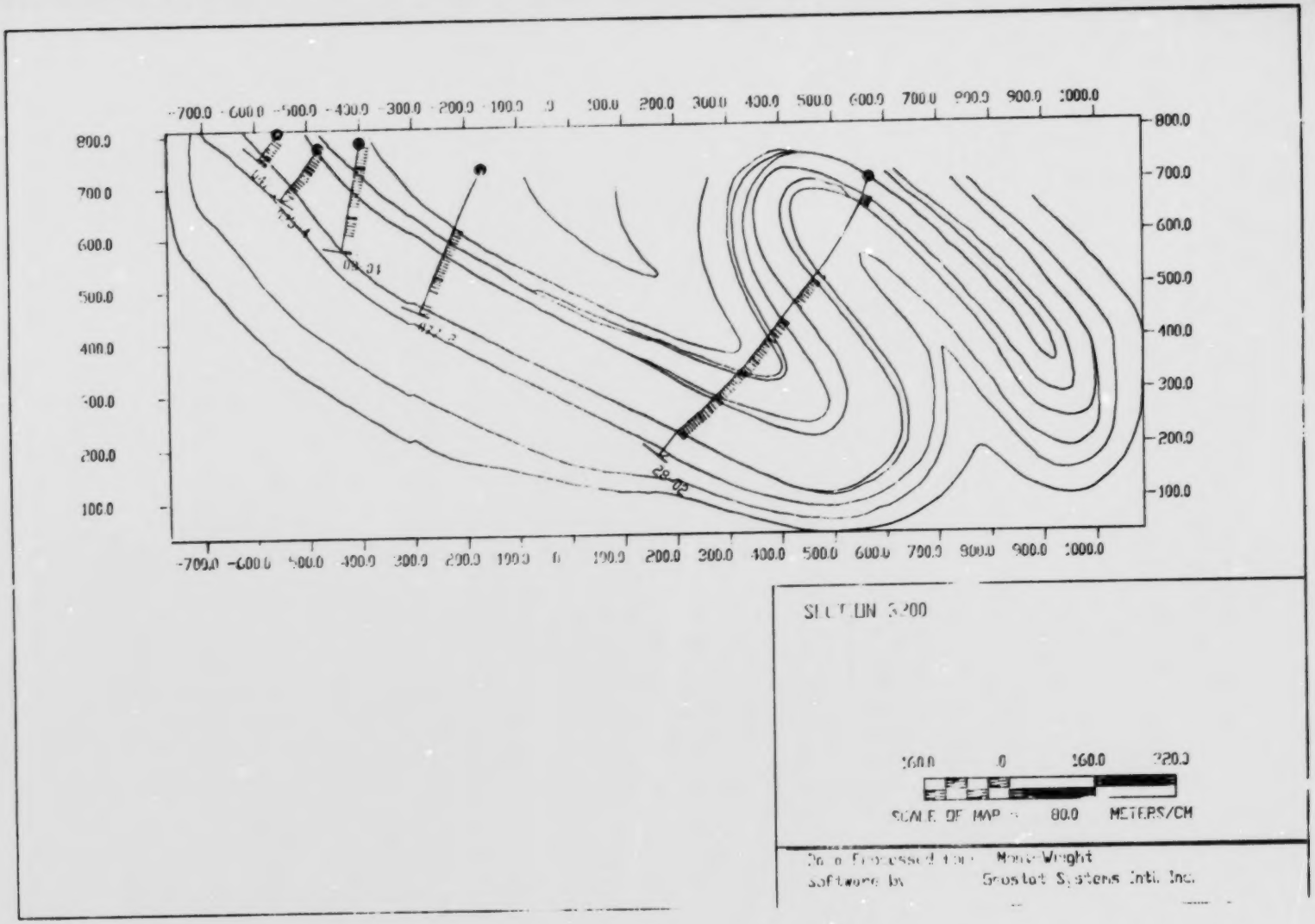

Figure 2.6: Interpreted section 3300 with drill hole profiles.

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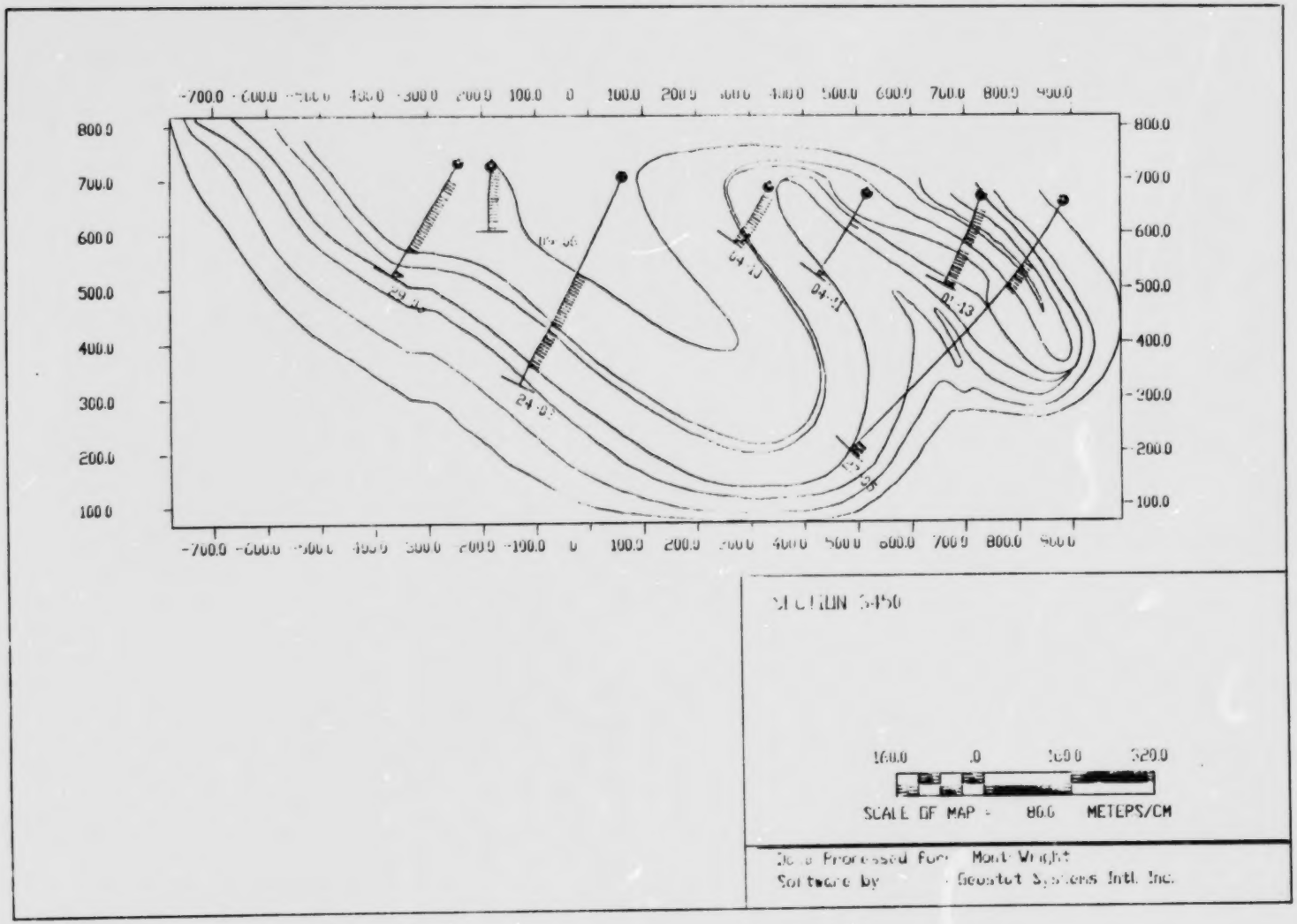

Figure 2.7: Interpreted section 3450 with drill hole profiles.

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Figure 2.8: Interpreted section 3600 with drill hole profiles. Ore layers (5,7,9) are shaded.

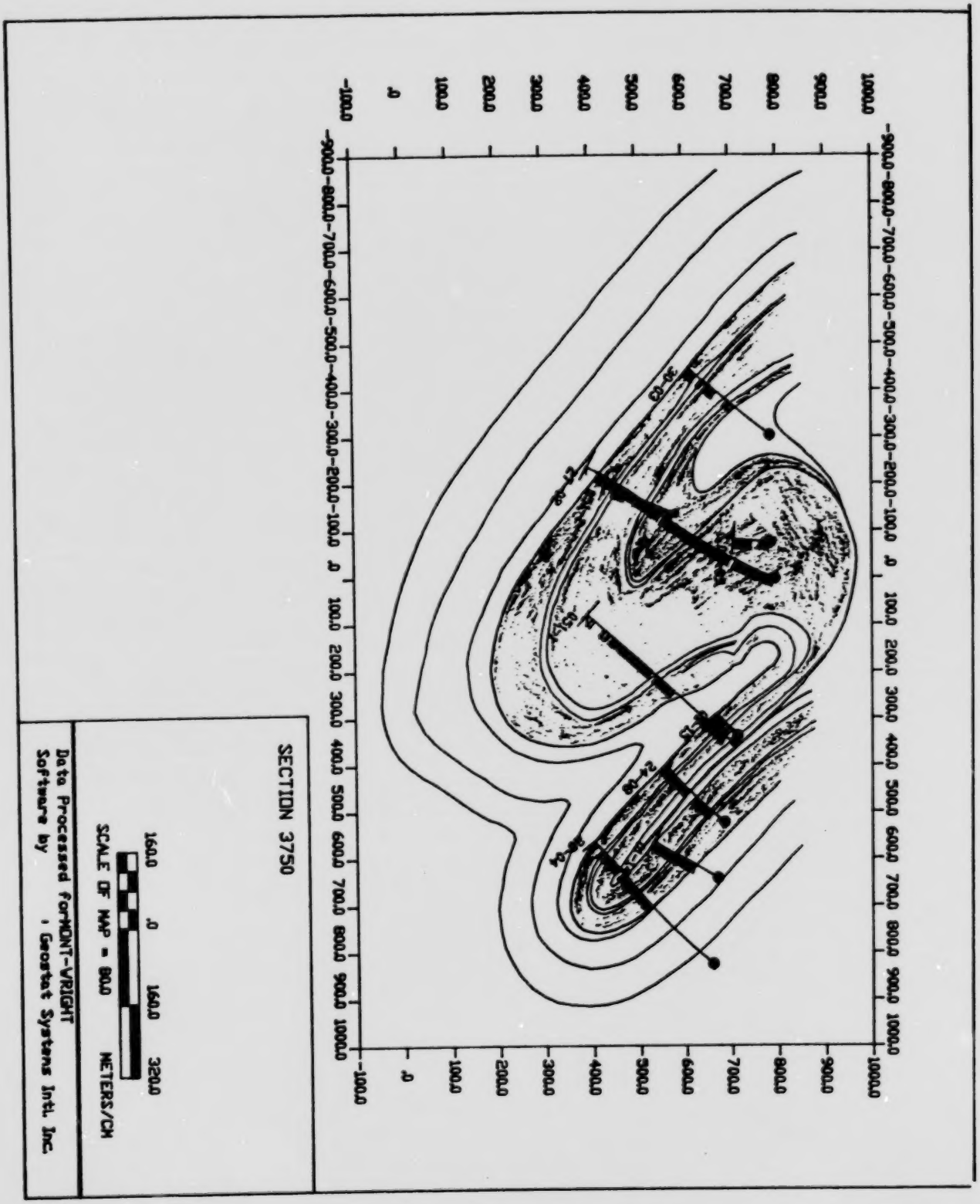
SECTION 3750
Data Processed for:KONT-WRIGHT
Software by : Geostat Systems Intl. Inc.
SCALE OF MAP = 80.0 METERS/CM
160.0 0. 160.0 320.0

Figure 2.9: Interpreted section 3750 with drill hole profiles. Ore layers (5,7,9) are shaded.

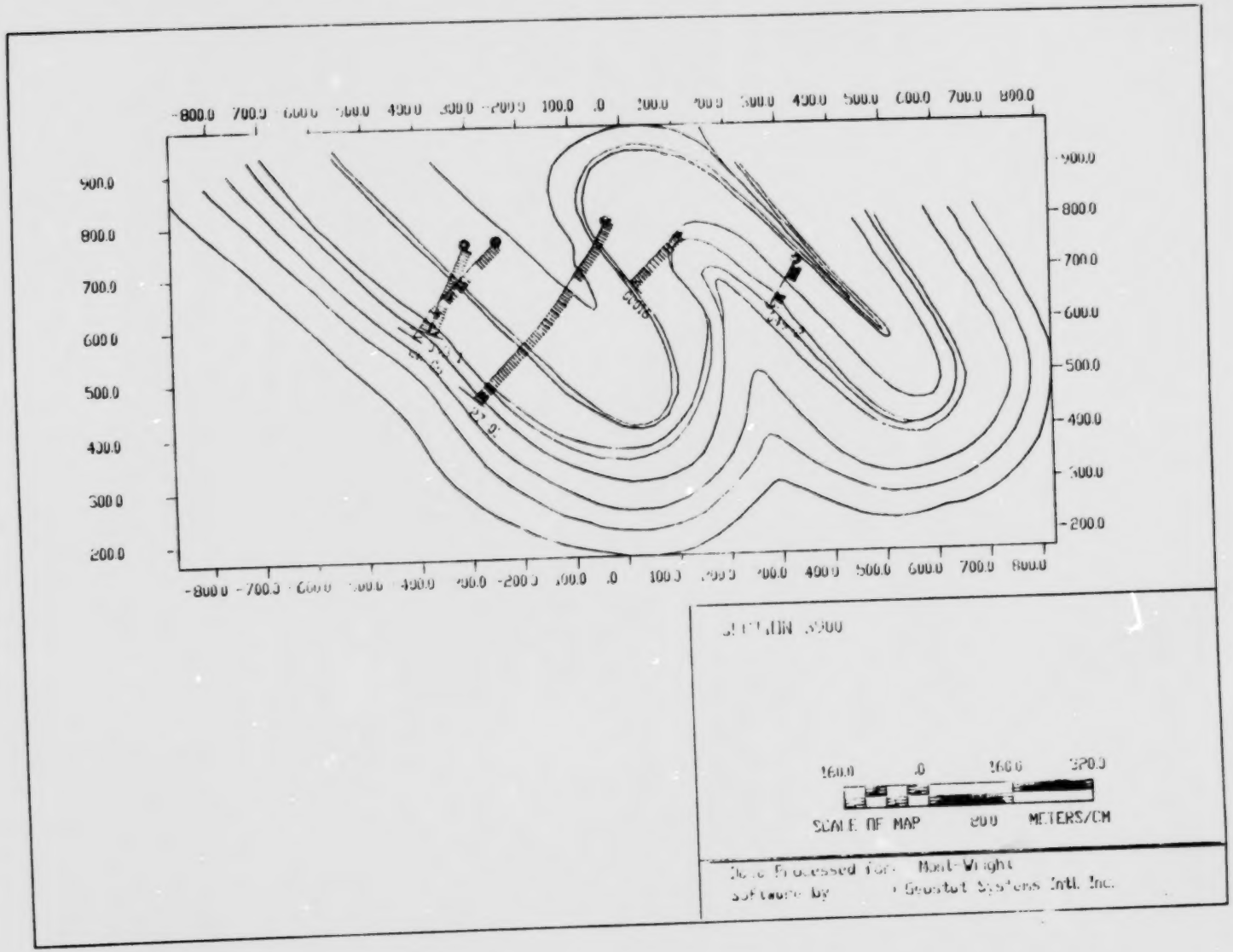

Figure 2.10: Interpreted section 3900 with drill hole profiles.

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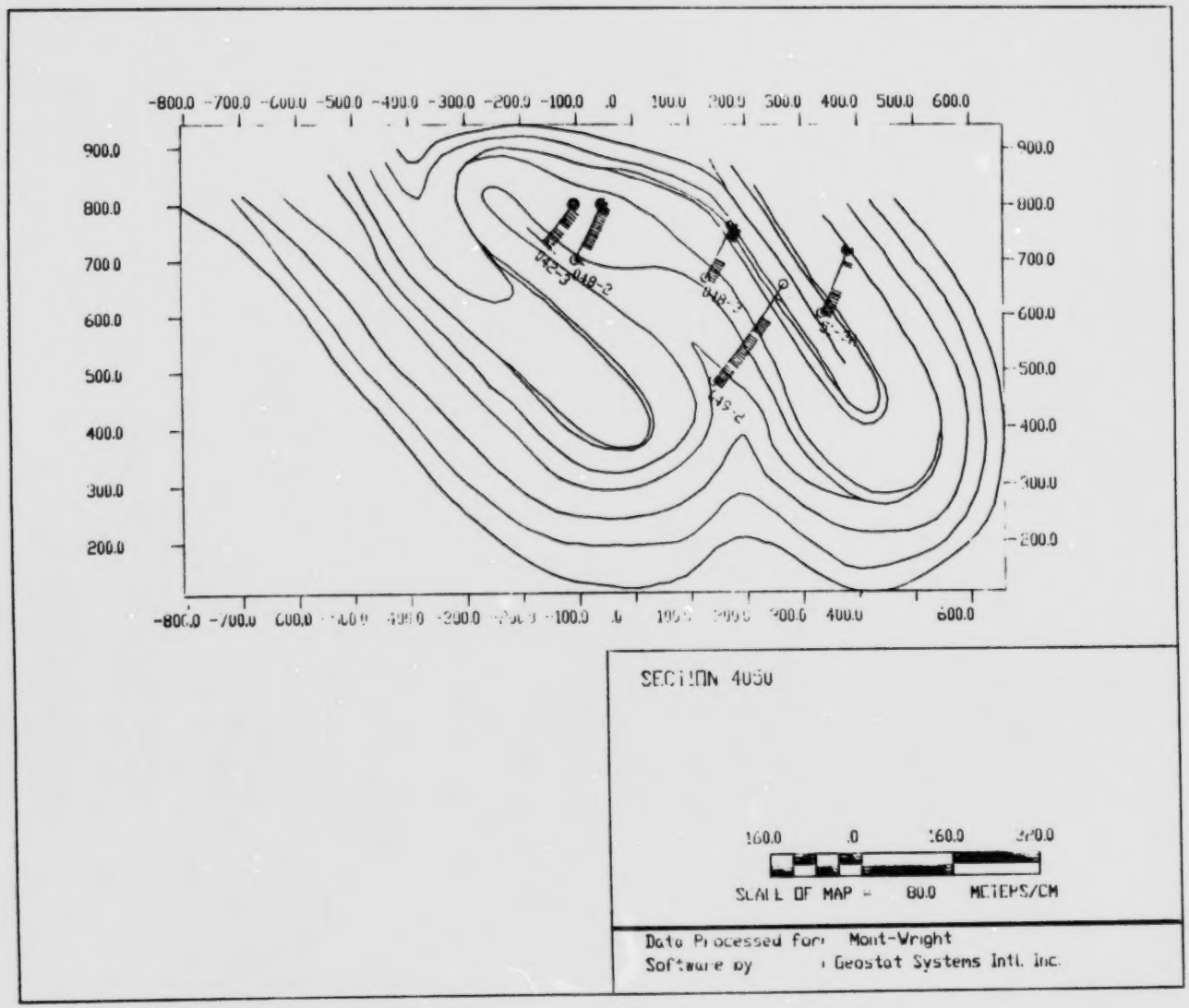

Figure 2.11 : Interpreted section 4050 with drill hole profiles.

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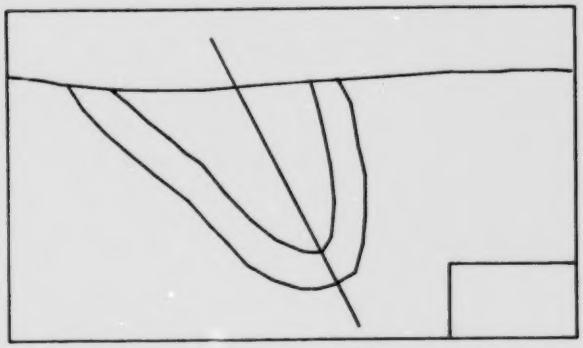
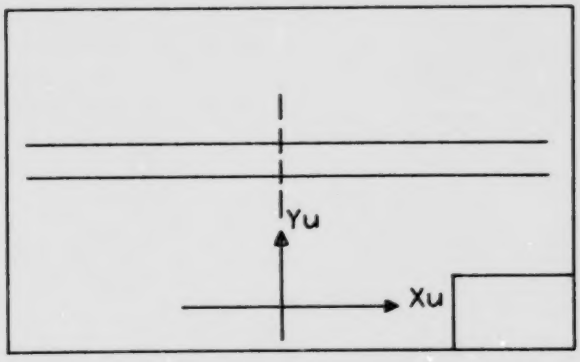


before unfolding



after unfolding

figure 2.12 : Unfolded coordinate system

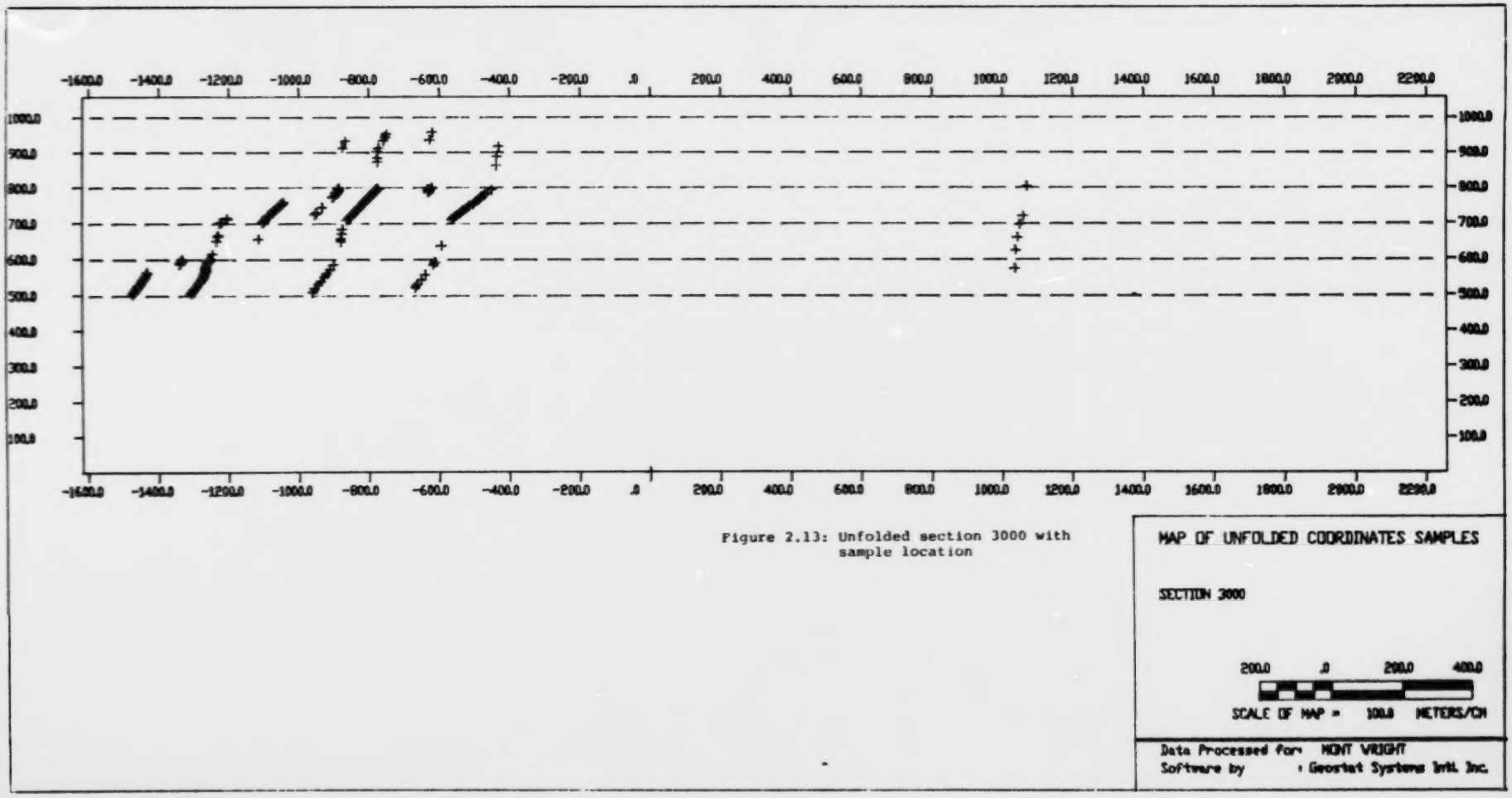


Figure 2.13: Unfolded section 3000 with sample location

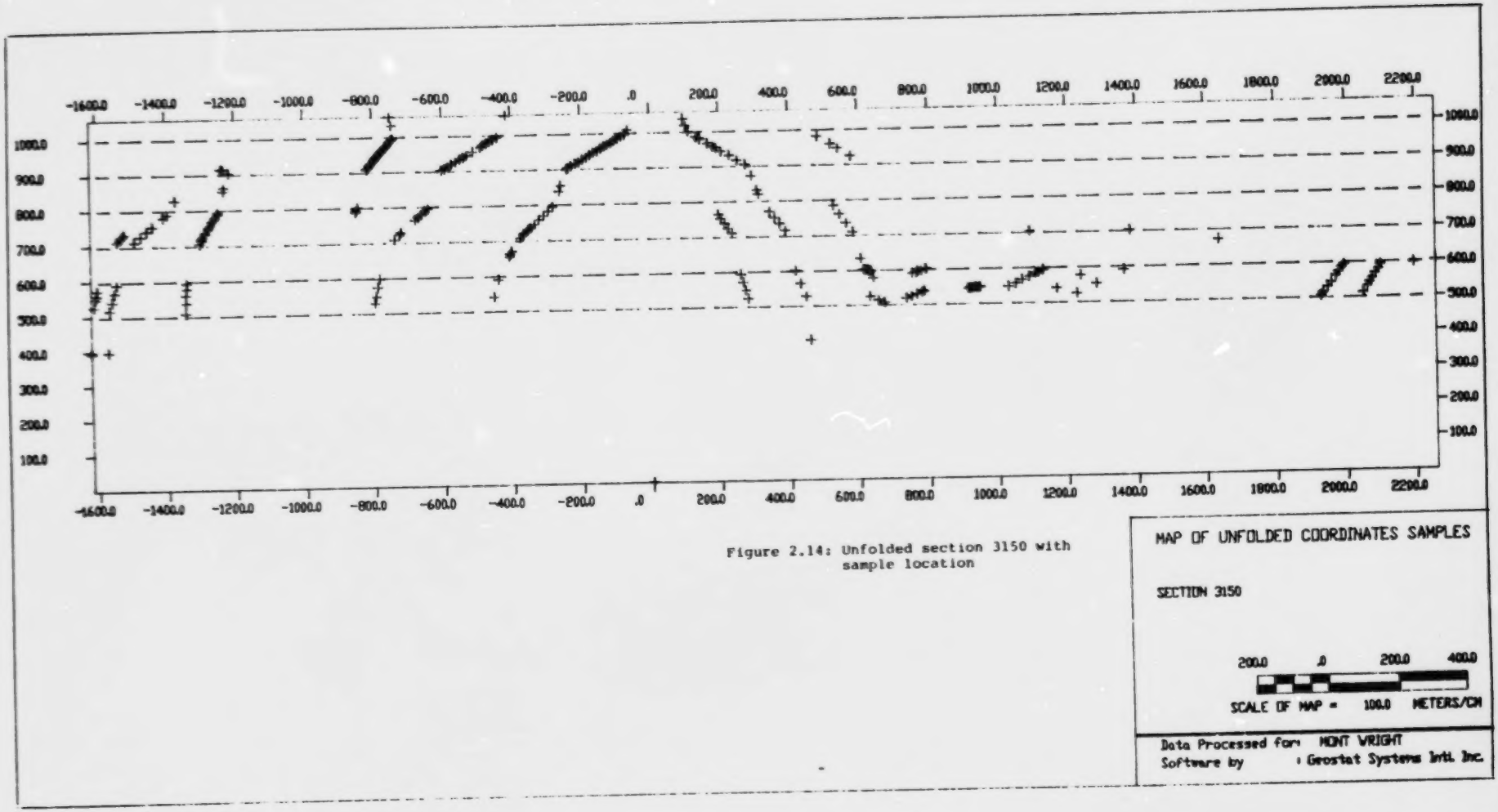


Figure 2.14: Unfolded section 3150 with sample location

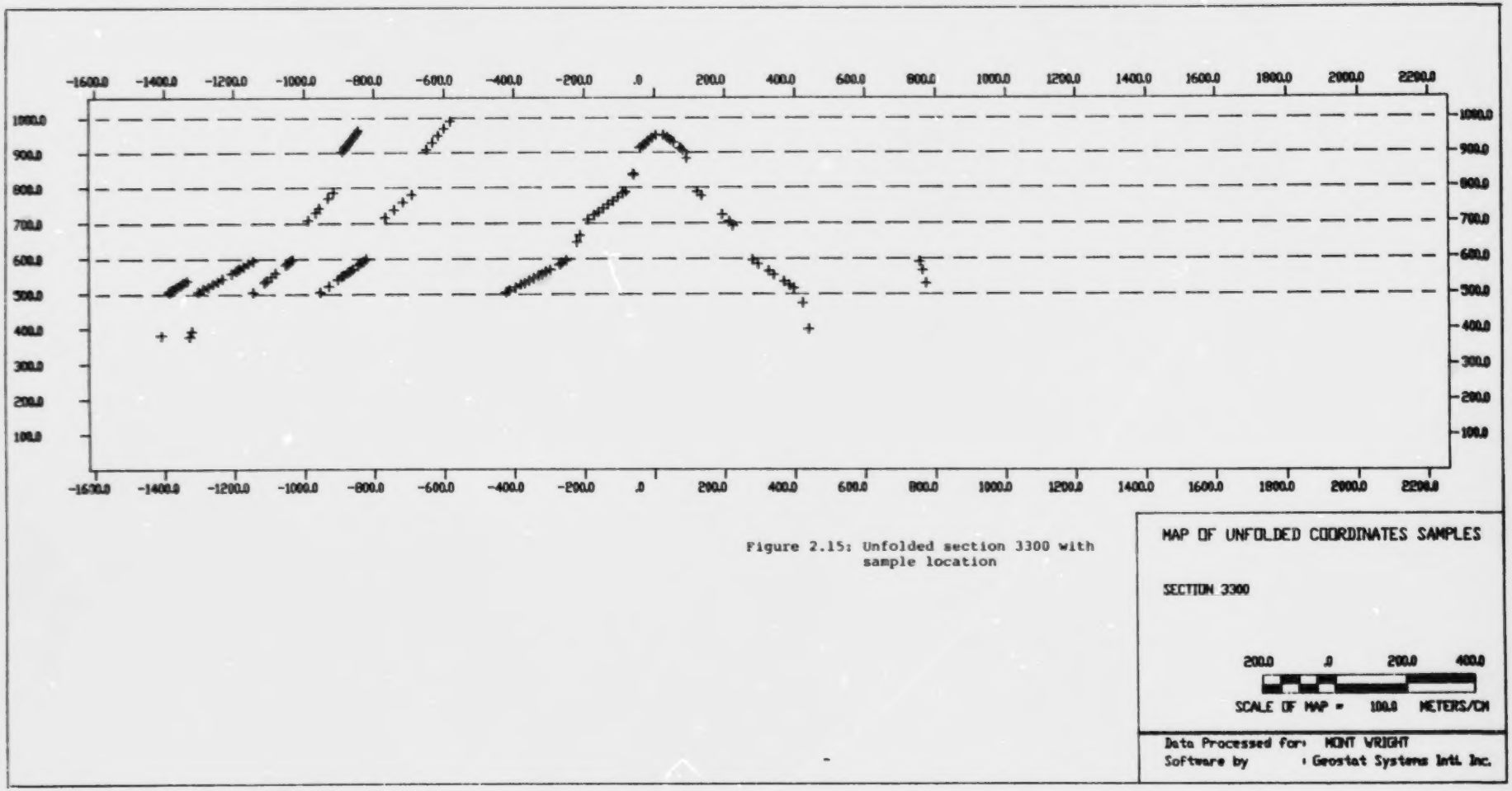


Figure 2.15: Unfolded section 3300 with sample location

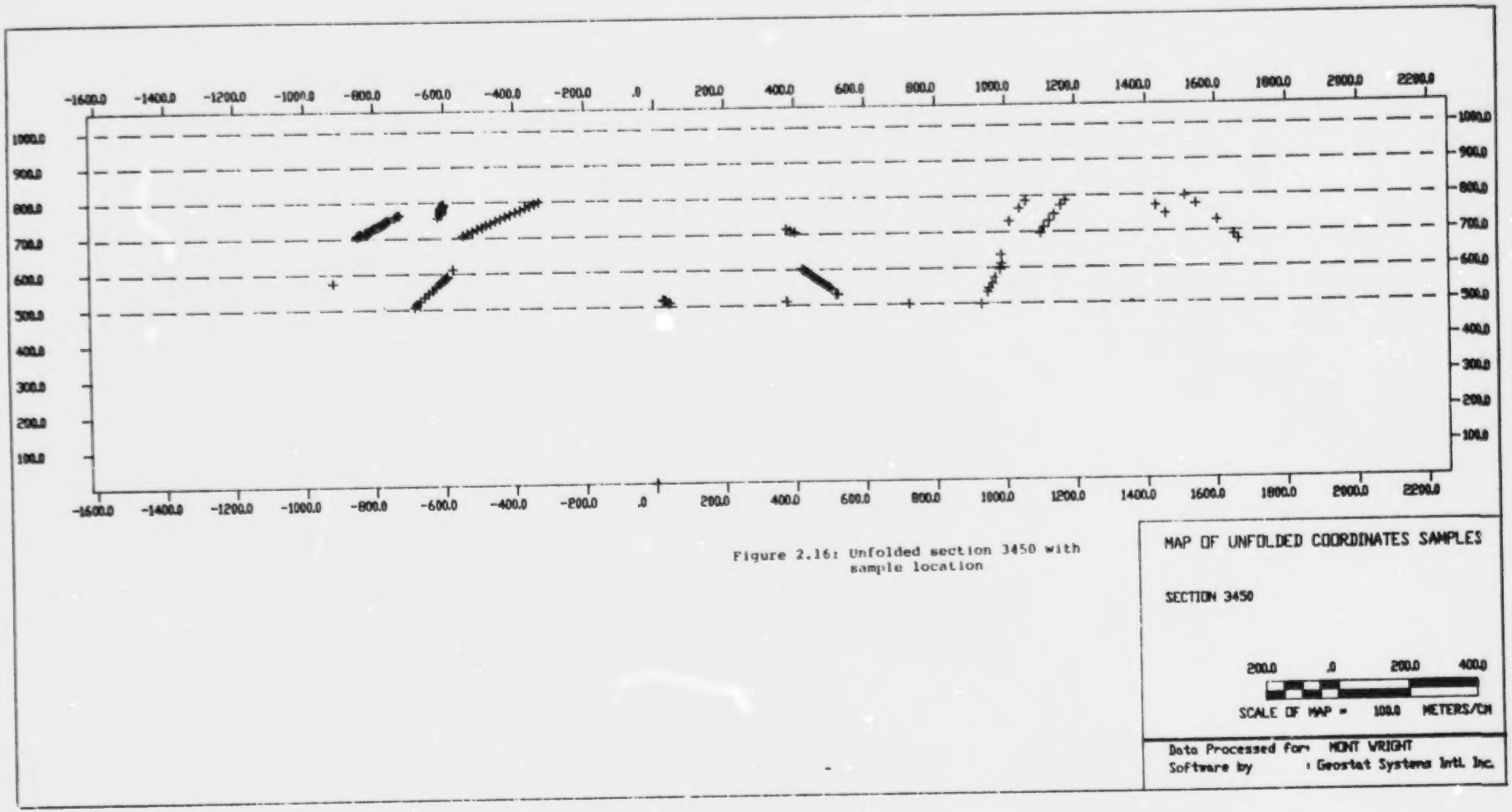


Figure 2.16: Unfolded section 3450 with sample location

Figure 2.17: Unfolded section 3600 with sample location

Figure 2.18: Unfolded section 1750 with sample location

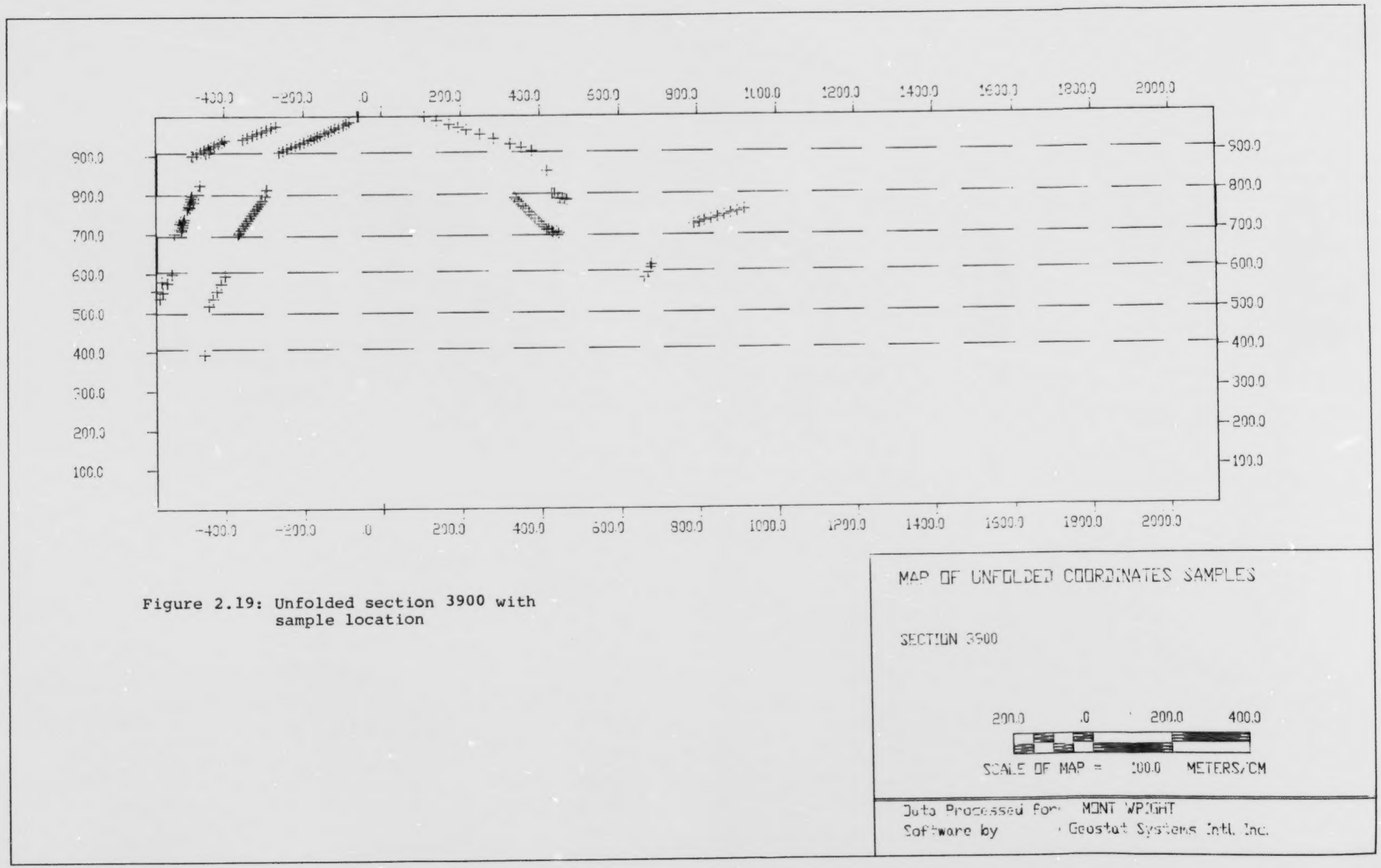


Figure 2.19: Unfolded section 3900 with sample location

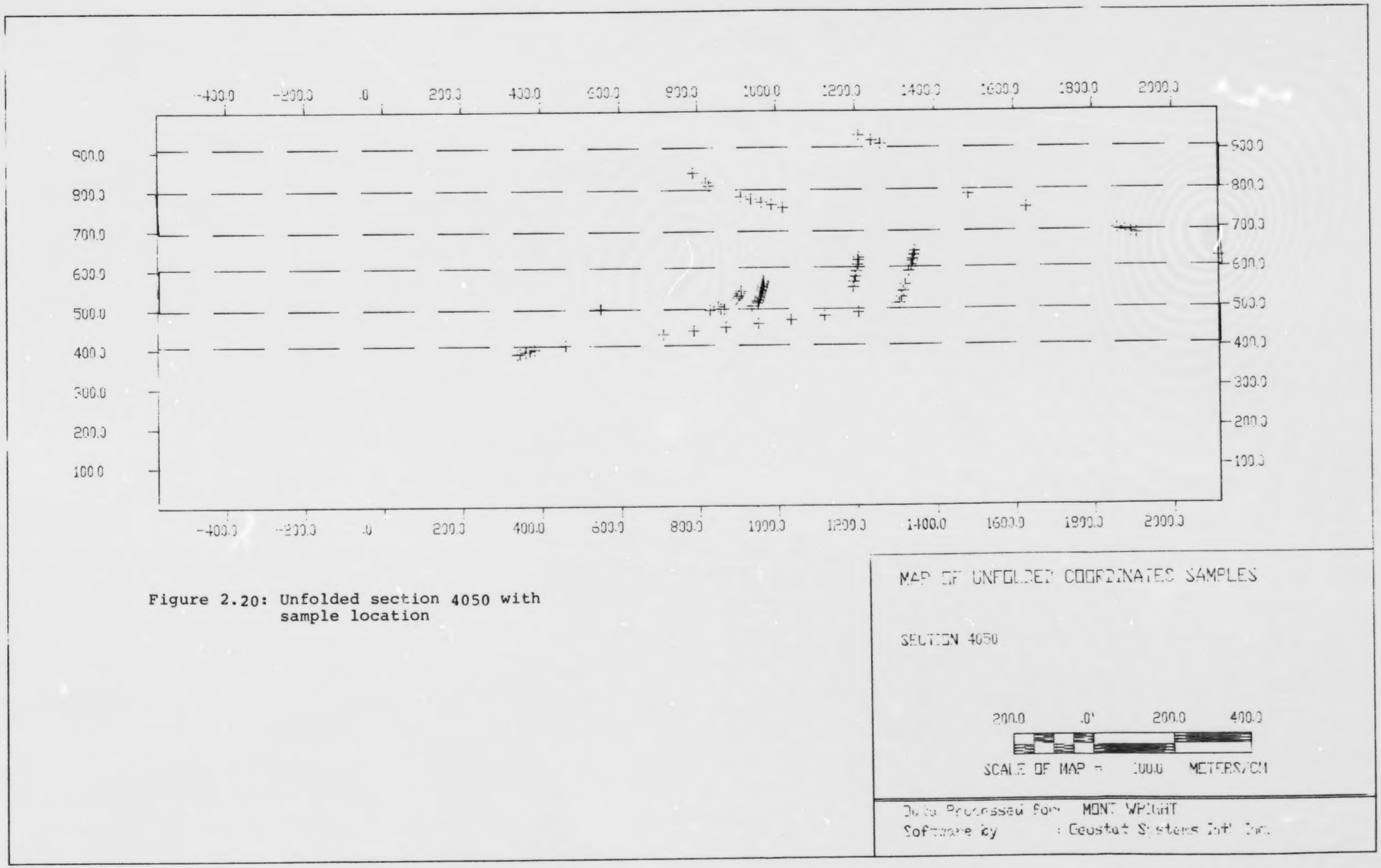


Figure 2.20: Unfolded section 4050 with sample location

3. STATISTICAL ANALYSIS OF SAMPLE DATA

General statistics can now be computed on a layer basis. The variograms will also be computed, they will respect the original stratigraphic nature of the deposit.

Drill hole data is listed in Appendix 2. Sample data with geographic and stratigraphic coordinates is listed in Appendix 3.

3.1 Statistics of % Fe and weight recovery

Histograms of % Fe and weight recovery of samples in the hematite layers 5, 7 and 9 (sections 3000 to 4050) are shown in figures 3.1 to 3.6. Statistics of the same data are presented in Table 2.

We can see that the layer 5 is the richest with an average of 33.26% Fe. The average falls to 27.54% Fe and 24.08% Fe in layers 7 and 9 respectively.

The histograms shapes are very similar in the three layers and suggest normally distributed populations. This is the case for both % Fe and weight recovery.

3.2 Variograms

The variograms are computed for % Fe and weight recovery. The variogram is the tool to measure spatial continuity of samples. It tells us how similar (or different) two samples separated by a certain distance are.

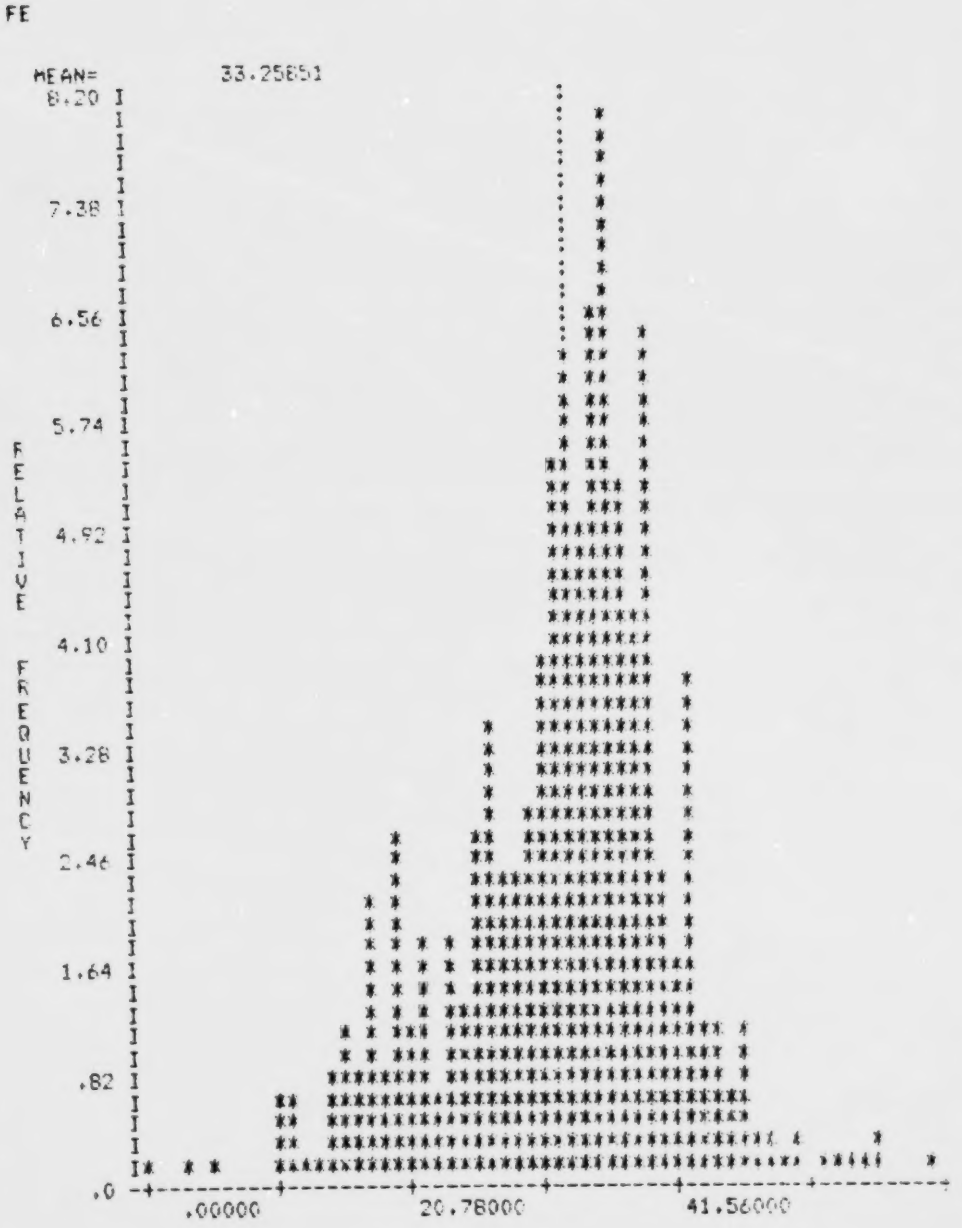


Figure 3.1: Histogram of % Fe in layer 5

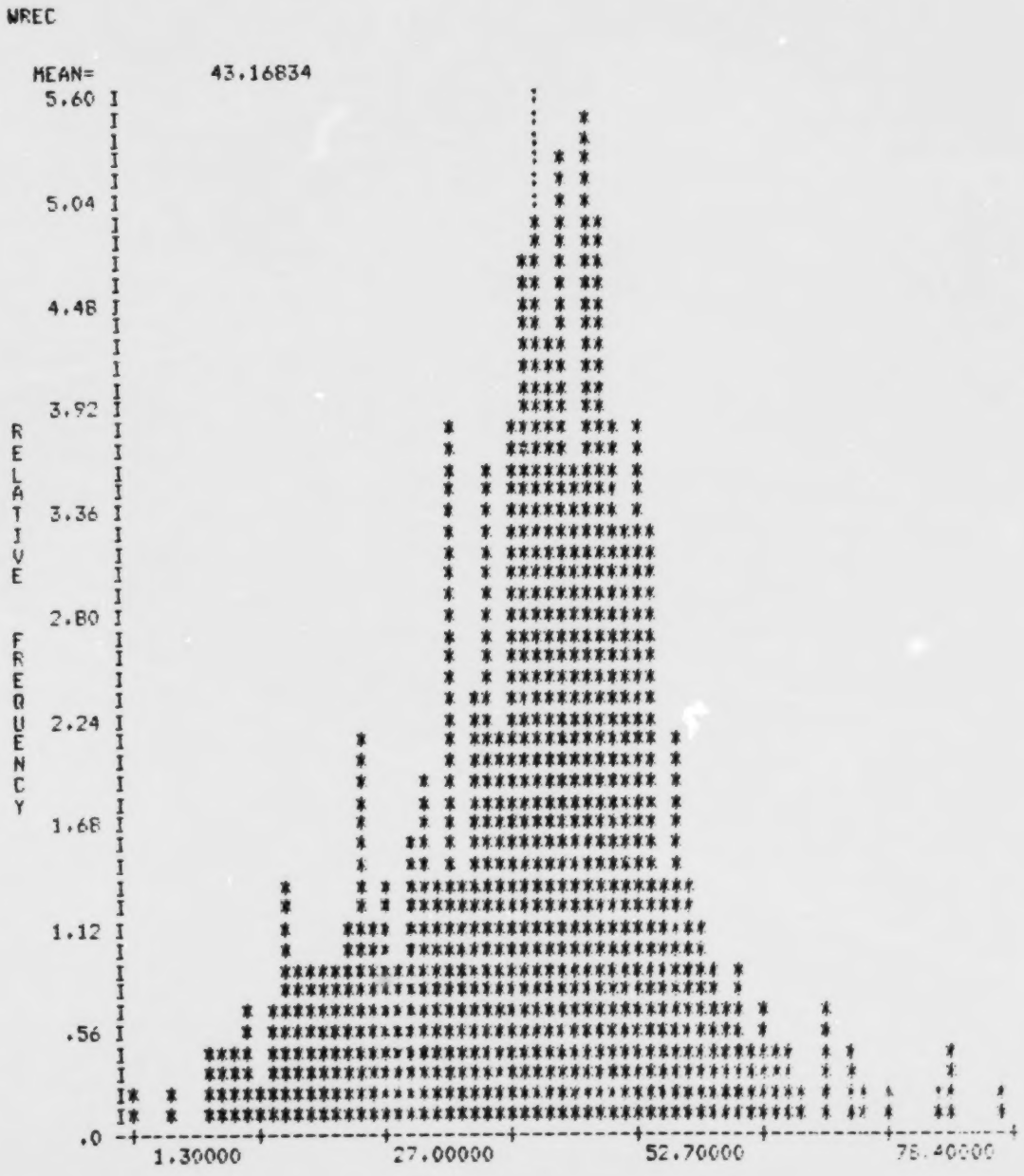


Figure 3.2: Histogram of WREC in layer 5

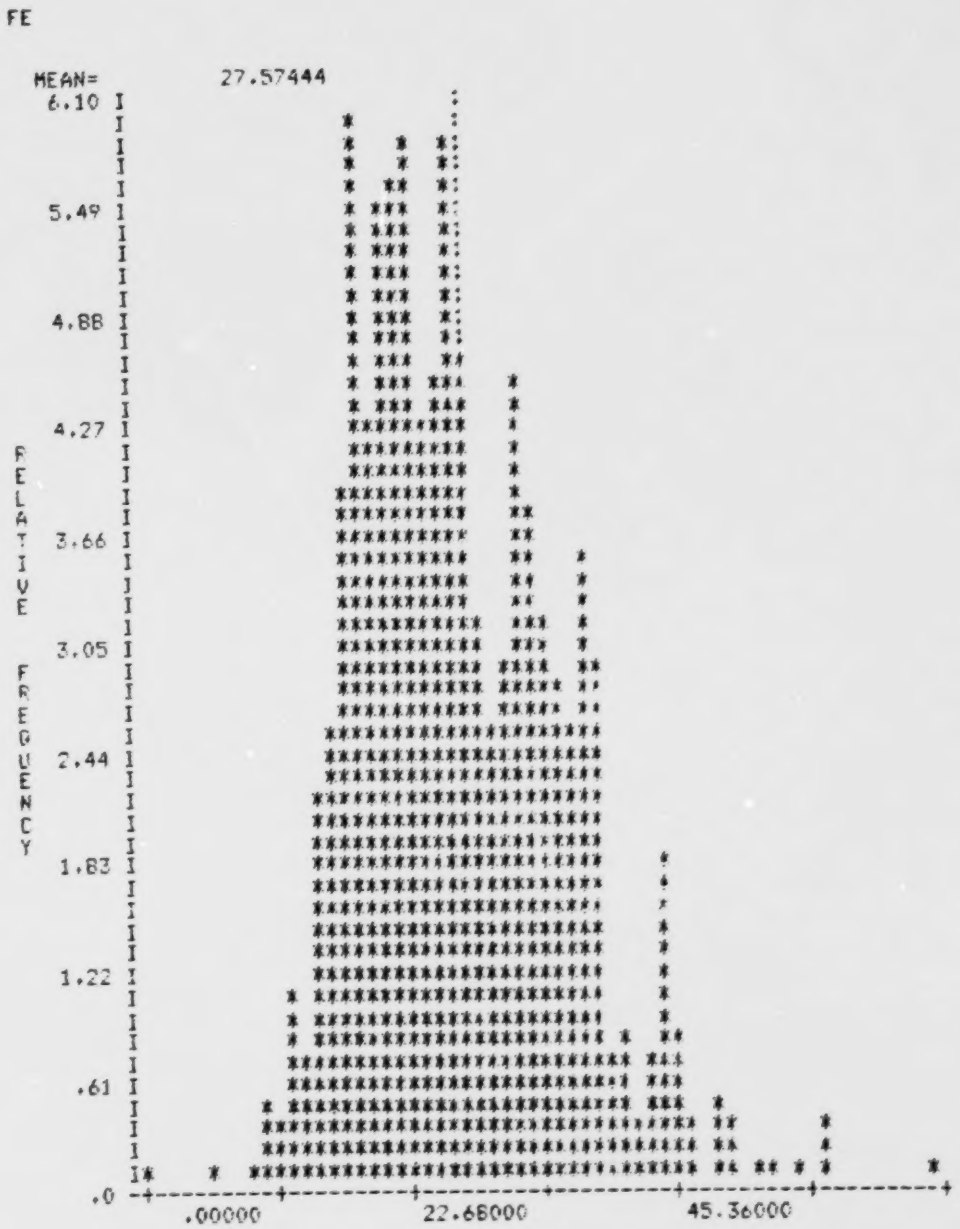


Figure 3.3: Histogram of % Fe in layer 7

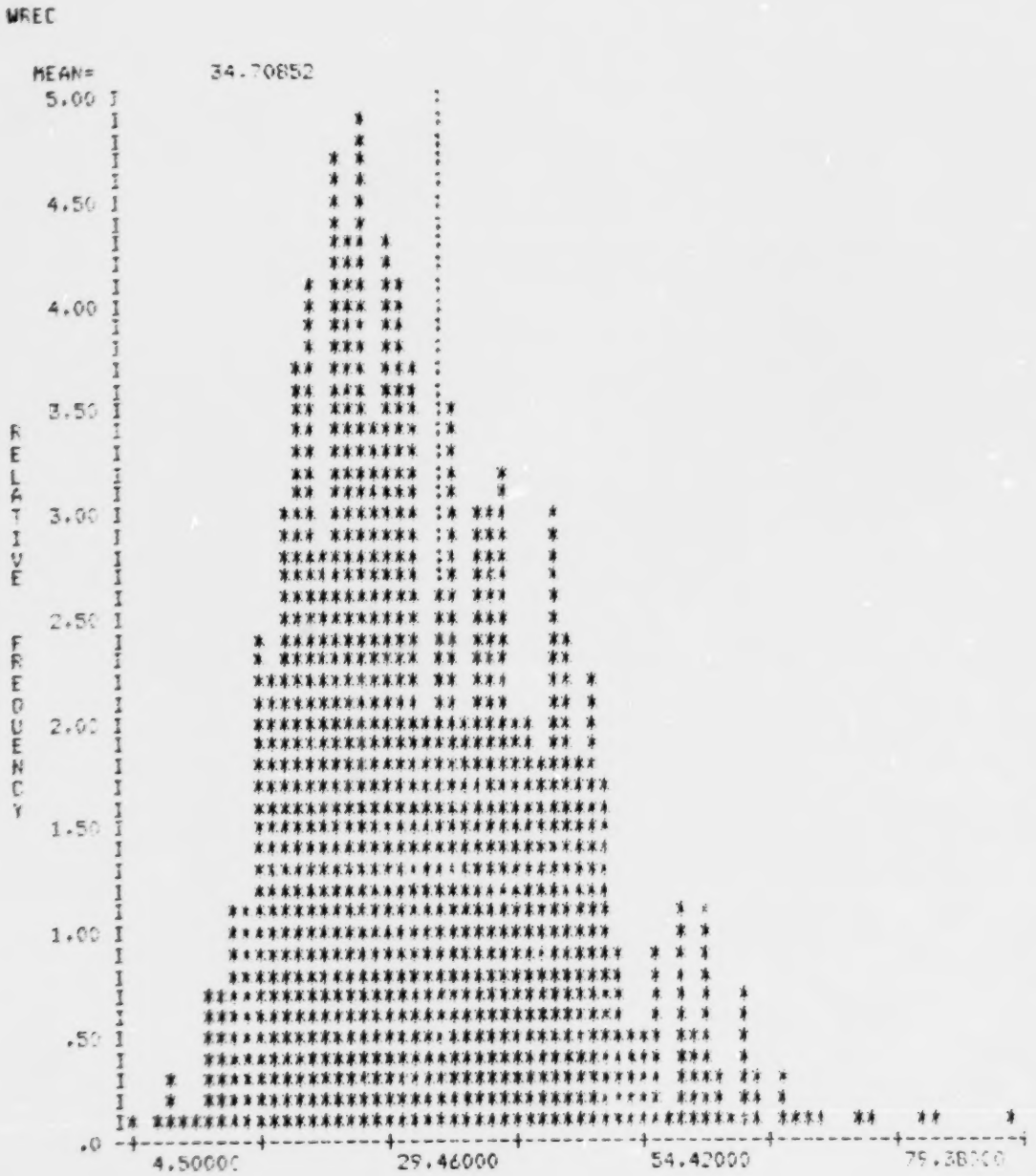


Figure 3.4: Histogram of WREC in layer 7

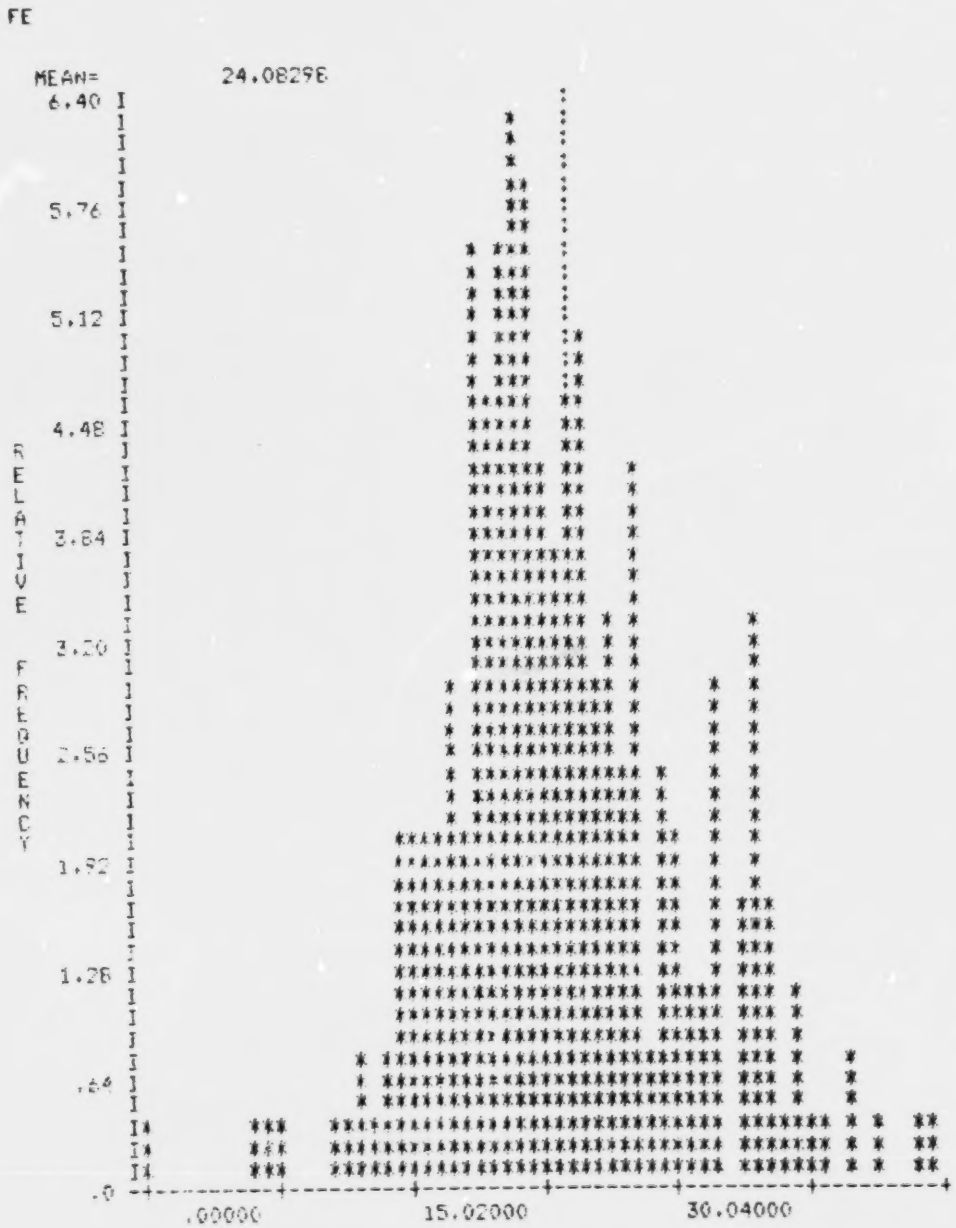


Figure 3.5: Histogram of % Fe in layer 9

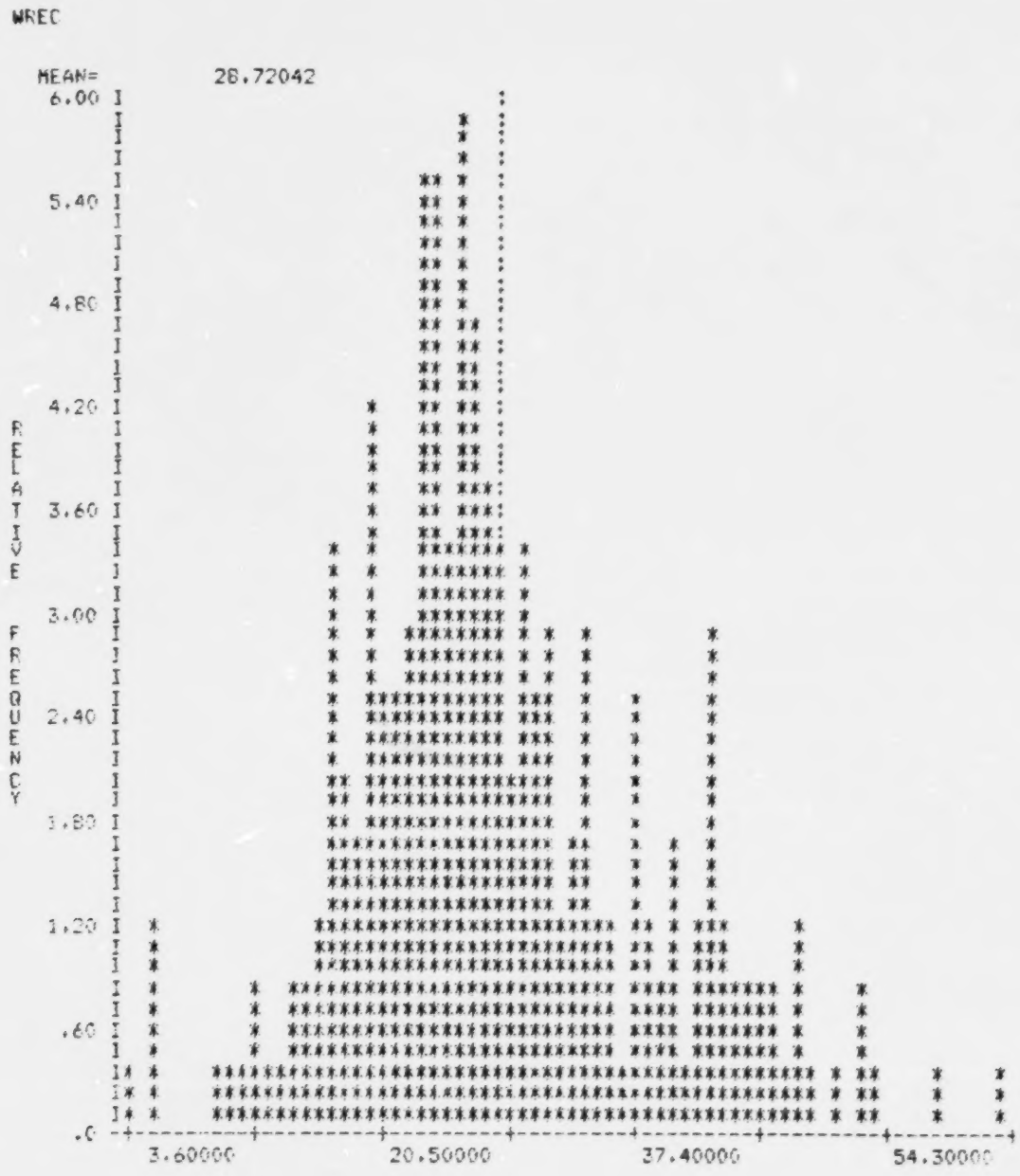


Figure 3.6: Histogram of WREC in layer 9

To compute the variogram we cumulate the squared differences between pairs of sample values (grade) separated by a certain distance and then divide it by the number of pairs used. That makes a point of the variogram. We then repeat the same process for several distances to get the experimental curve of the variogram. The variogram is then a function of the distance between samples (not their absolute positions) and of the difference between their values (not the grades themselves). Figure 3.7 shows the principle underlying the construction of a variogram.

One point to note here. The distance we are talking about is the distance between two «unfolded» points. This distance is somewhat artificial since the unfolded Y coordinate is in fact the layer number and its relative position between the bottom and the top of the layer. This is no problem however since kriging will be performed in the same unfolded space.

Knowing the spatial continuity is very important since it tells us how to extend the grade of samples near a block to produce an estimate for that block. If continuity is poor, we should not rely too much on the few samples inside the block or very close to it. If continuity is better along a direction than along another one, more influence should be given to the samples that are in this direction with respect to the block.

Because of the relatively small number of samples in each layer, layers 5, 7 and 9 were grouped together.

The variograms were computed using program VARIO3. Documentation about this program can be found in appendix. In figures 3.8 and 3.10 we show the variograms of % Fe and weight recovery respectively, along several directions of section planes. Figures 3.9 and 3.11 show similar variograms but for directions across the sections.

The variogram model chosen for both % Fe and weight recovery is:

1 - % Fe: $\gamma(h) = 27.5+S\ (18.5,40) + S\ (36.45,600)$

2 - Weight recovery: $\gamma(h) = 60.0+S\ (50,40) + S\ (76.8,600)$

where S(a,b) stands for a spherical model with sill a and range b. The models are made of 3 parts:

1 - a nugget effect, which represents a very small scale discontinuity

2 - a spherical model with short range

3 - a spherical model with long range

		%Fe	Weight recovery
LAYER 5	N	417	417
	Min	0.0%	1.3%
	Max	62.3%	91.2%
	Mean	33.26%	43.17%
	Std	9.0	13.72
LAYER 7	N	528	528
	Min	0.0%	4.5%
	Max	68.0%	91.8%
	Mean	27.54%	34.71%
	Std	9.01	13.48
LAYER 9	N	235	235
	Min	0.0%	3.6%
	Max	45.0%	62.7%
	Mean	24.08%	28.72%
	Std	6.9	10.05

Table 2: Statistics of %Fe and weight recovery

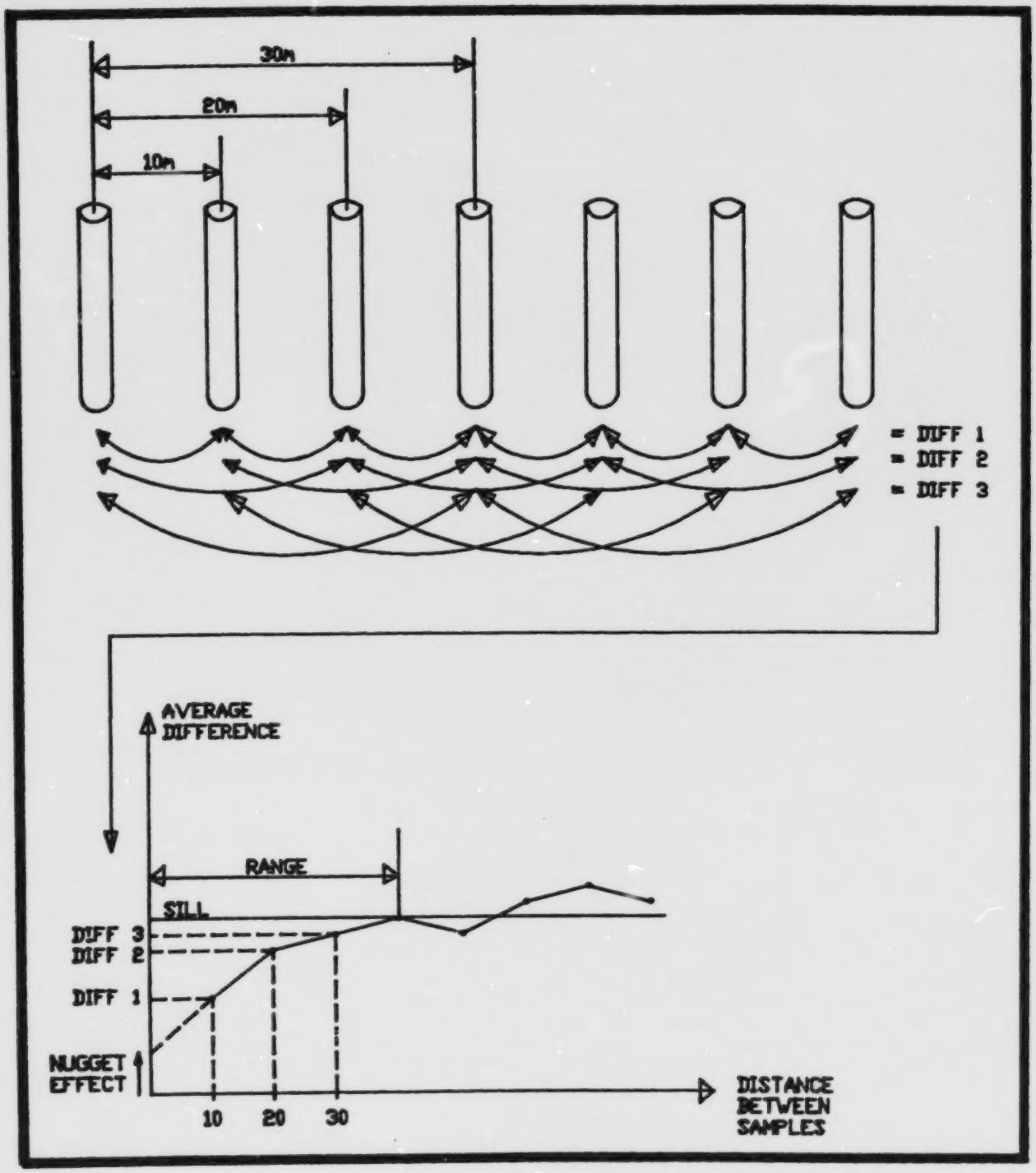


Figure 3.7: Principle underlying the construction of a variogram

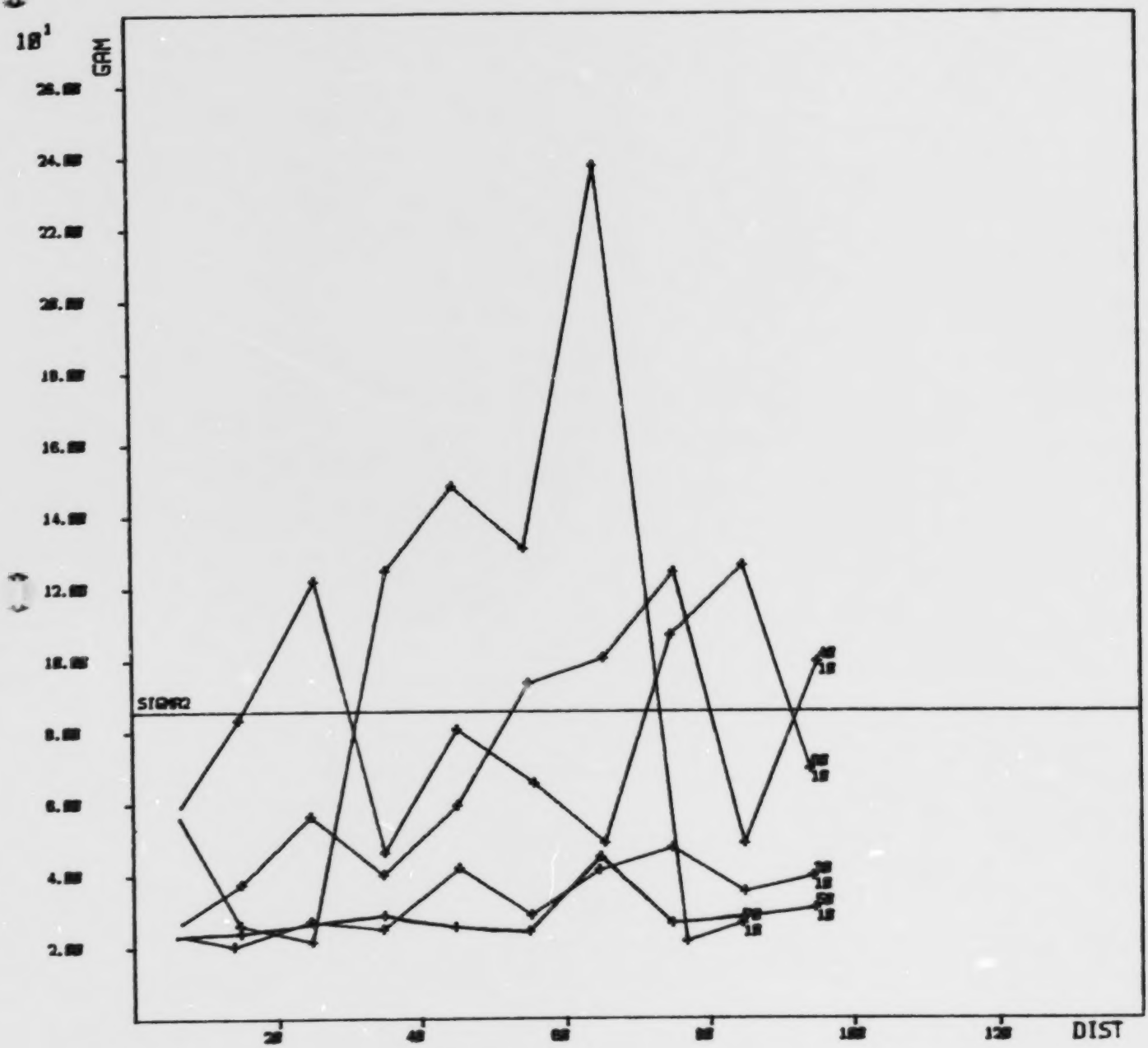


Figure 3.8: Variograms of % Fe along directions of the sections

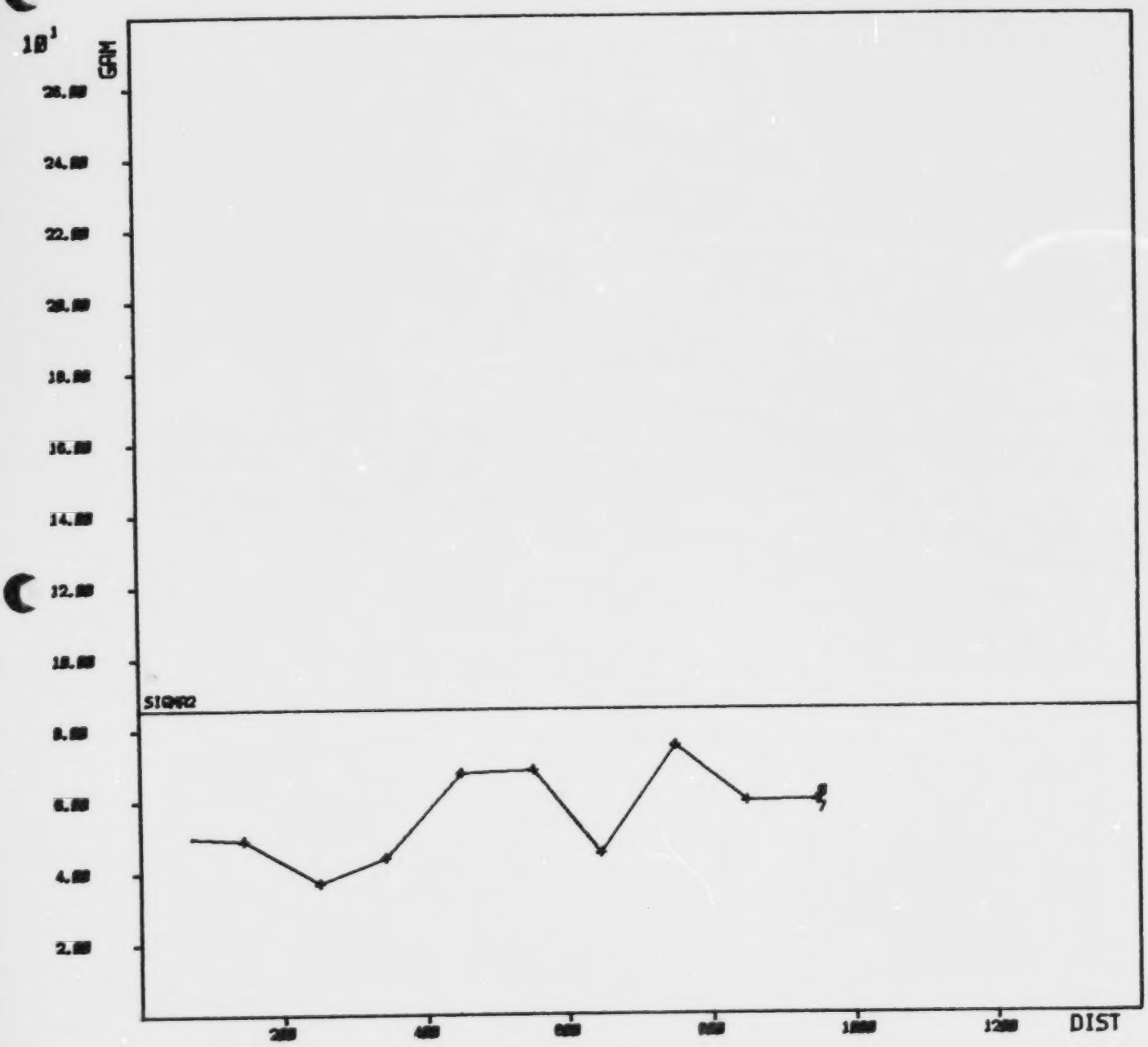


Figure 3.9: Variogram of Fe across the sections plane

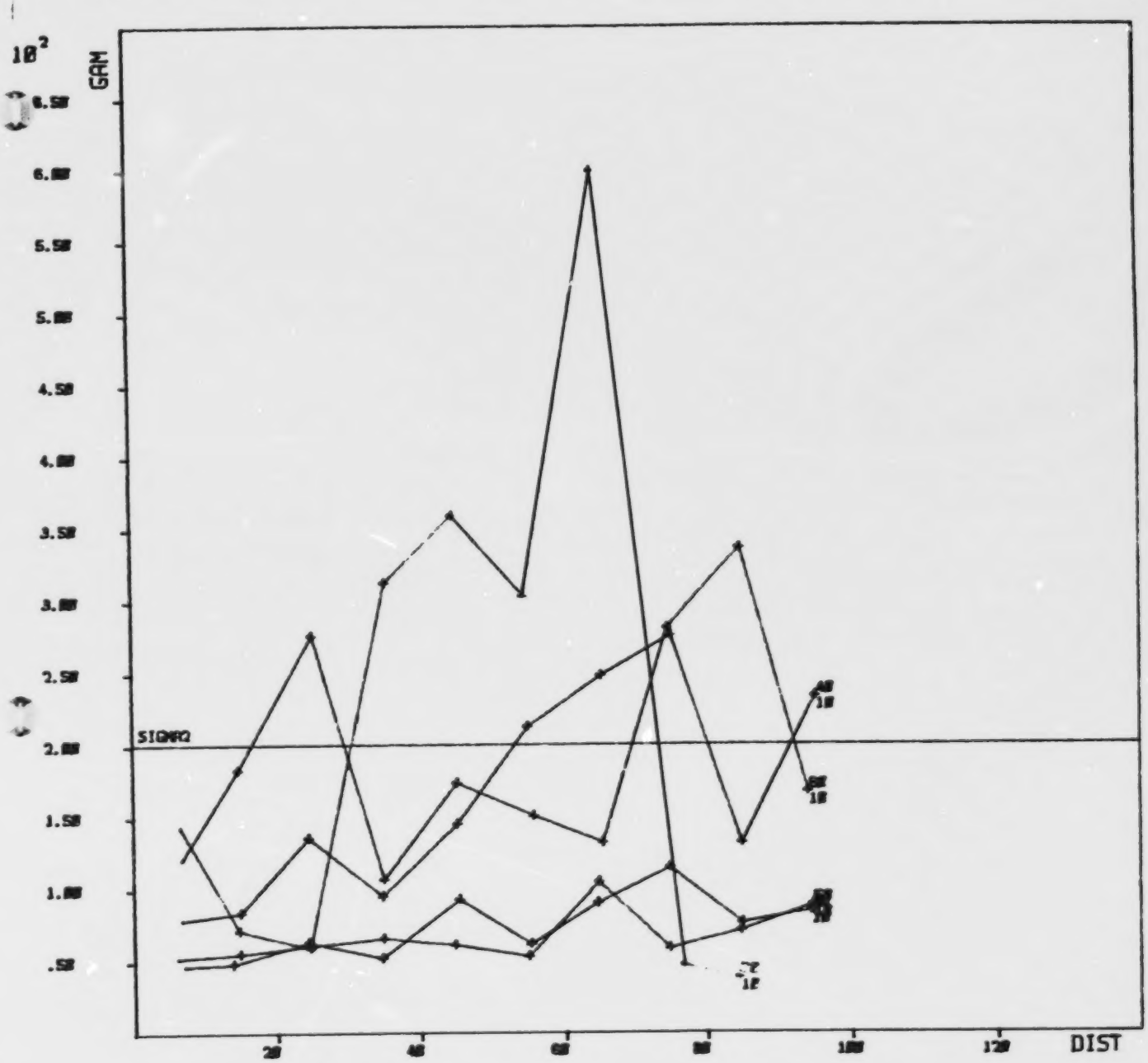
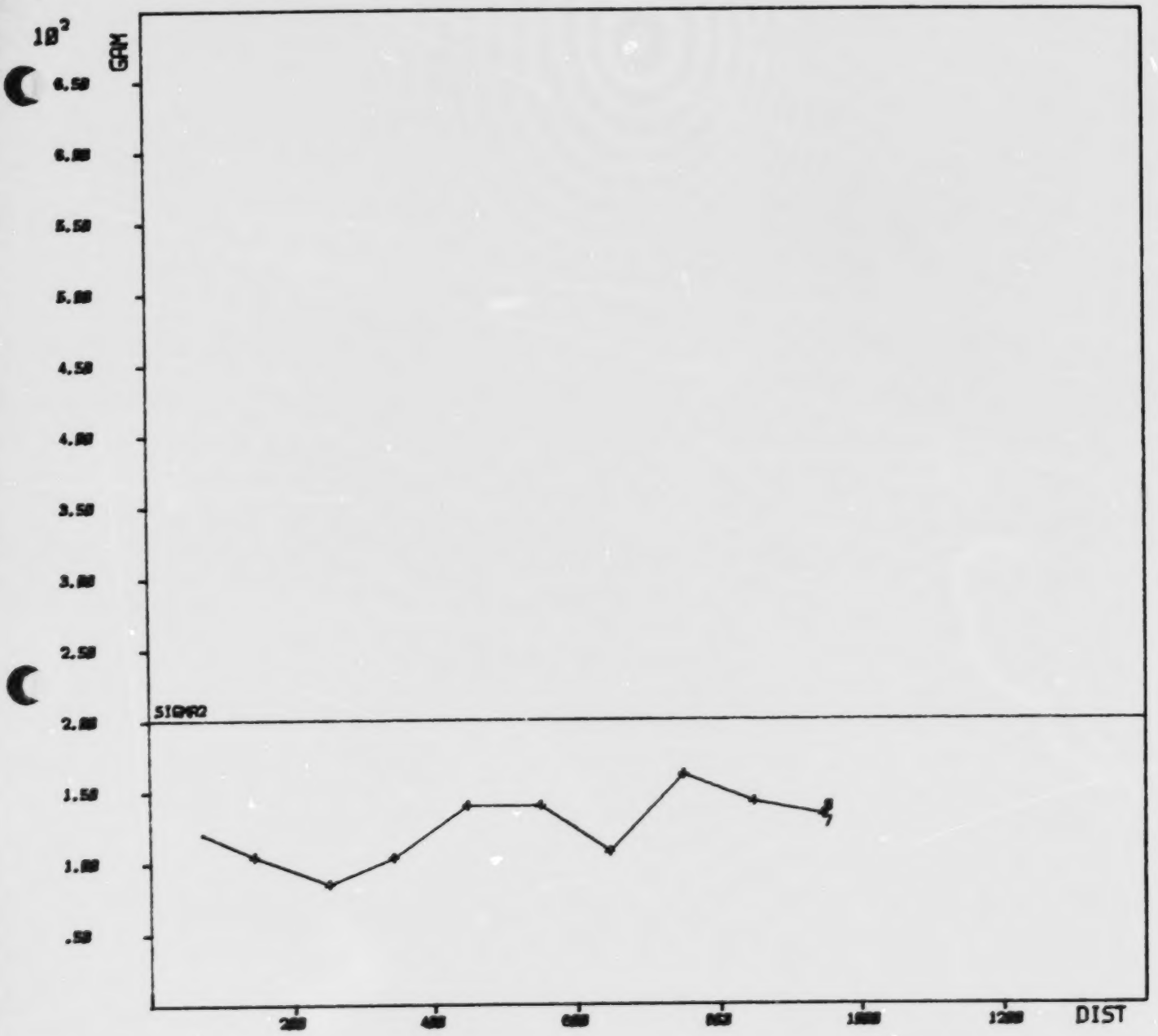


Figure 3.10: Variogram of weight recovery along the directions of the sections



VARIABLE VREC ABSOLUTE VARIOGRAM
MONT-VRIGHT TEST RUNS ON UNFOLDED DATA LAYERS 5,7,9

Figure 3.11: Variogram of weight recovery across sections plane

4. KRIGING OF BLASTS AND COMPARISON WITH PRODUCTION

The purpose of developing the method described above for «unfolding» is to properly estimate blocks or volumes of material.

A proper estimation requires that one should only use samples similar in geology to the volume to estimate. That is why we classify the samples according to their layer number. It also requires that the distance between the volume and the samples is the original one, prior to folding. Those requirements are now met and a standard kriging procedure can be used to estimate a given volume.

4.1 Definition of a blast

The volumes we are going to estimate are in our case, actual blasts. Using these volumes has one main advantage, it allows the technique to be tested against actual results.

However any volume could be used, from a single point up to the entire area.

The blasts have to be numerically defined. The geometric shape of a blast has to be discretized by a number of discrete points. This is the computer way to «visualize» the 3D shape of a volume. The more points used to discretize a volume, the more accurate the numerical representation of the volume is.

Before discretizing a blast we need to know its contours. We assume here that the contours made of the crest of the blast and of its bottom are identical, and that the thickness of the blast is constant over its surface (see Figure 4.1).

A program called BLAST was developed to perform blast discretization. The program reads a digitized blast contour and superimposes onto it a 3D grid of points. Then the program discards all the grid points that fall outside the contour. Figure 4.2 shows a flowchart of the entire estimation process including discretization.

The output of BLAST is a file containing the X, Y and Z coordinates of all the discretized points. These points have to be assigned stratigraphic coordinates to properly position the blast in the stratigraphic column. This is done using UNFOLD.

At this stage, we know the constituents of the blast in terms of layers or geology. We also know the stratigraphic position of the blast which is then compatible with the unfolded samples set.

Program KRIBLAST performs kriging of the blast known by its unfolded discretized points using the unfolded samples. The program only estimates one layer at a time. One run per layer is needed. The global estimate is then the weighted average of the layer estimates.

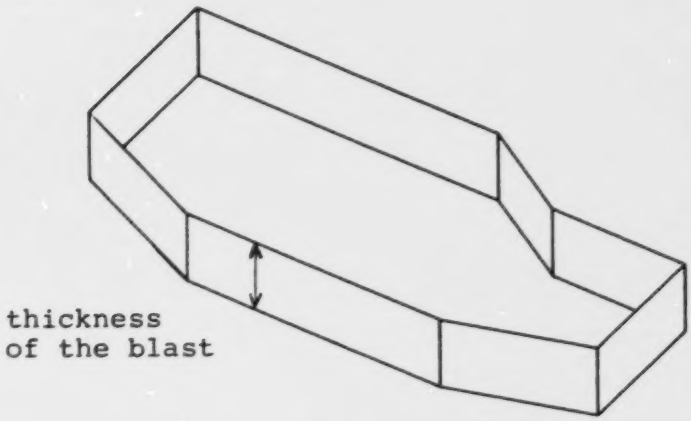
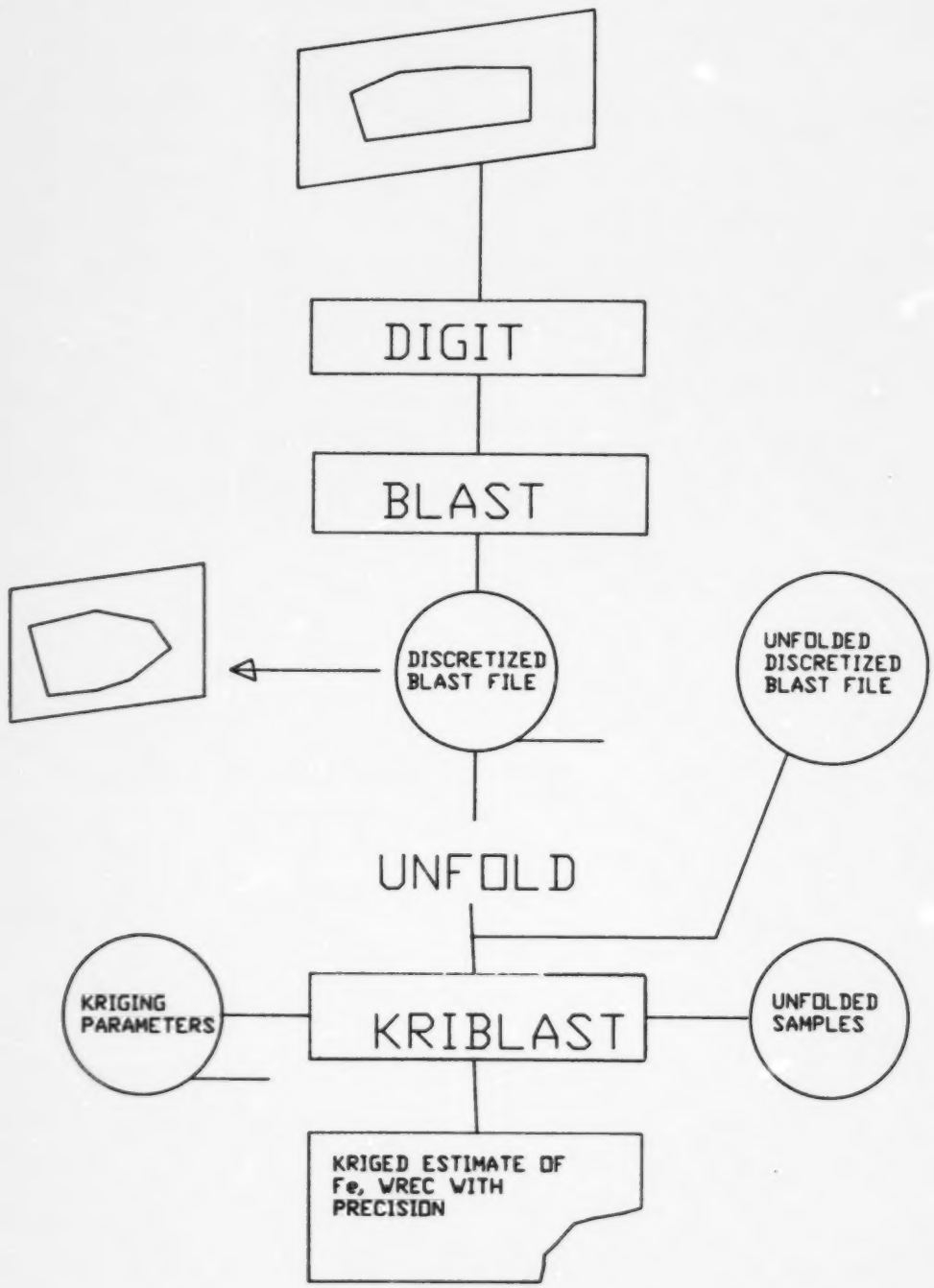


figure 4.1: Typical blast shape using the assumptions mentionned in text.

figure 4.2 : flowchart of the estimation procedure



KRIBLAST estimates both Fe and WREC at the same time.

4.2 Kriging and comparisons with actual production

The method described in this report is tested against actual production figures in blasted area. In total 9 blasts are tested. In this section we will describe each blast, and compare kriged estimates with production figures. All the information concerning the blasts are taken from the foremen sheets.

4.2.1 Blast P-700-43

This blast is located on section 3600 between 400S and 100S (see Figure 4.3). It is composed of hematite layer 7, amphibolite, layer 8 and of hematite layer 9. As for all the blasts the thickness is set to 14m.

We used 42 points to discretize the blast; they are on a grid of 1 x 21 on 2 levels. Since the blast is right on section 3600 it is worthless to generate more than one column of points. The geology taken from the section model would be the same for both columns.

The comparative results are tabulated in Table 3. As we can see the results are very similar in

both grade and tonnage. We have estimated 62% of the blast as ore at 28%Fe and we actually have 67% of ore at 28.5%Fe.

This means that for this blast the geology model is well defined and the technique worked fine.

4.2.2 Blast P-700-42

This blast is located next to P-700-43, still on section 3600 between 420S and 250S. The blast is composed of only one ore layer (7) and of amphibolite layer 8.

We used 60 points to discretize it on a grid of 2 x 15 x 2. We have two columns of 15 points each on two levels. We generated two columns of points because the blast is slightly closer to another section (3750) and that sample points could come from it and because the blast is less elongated than P-700-43. One should always try to respect the relative geometry of the blast.

Table 4 shows comparative results of blast P-700-42. Here again, the geology model is well defined since the modelled ore portion of the blast is the same as the actual ore portion (63.3%). The grade results do not match. This can

easily be explained by the fact that the mineralization has locally changed drastically. We can see on Figure 4.4 that the high grade portion of layer 7 is considerably smaller than the similar portion on blast P-700-43. This is a local variation. Unfortunately, the diamond drill hole data used to estimate the blast does not reflect such small scale variations. Obviously, the same samples were used in kriging layer 7 in both blasts and the estimated results are very similar. This example shows one limitation of any estimation method: the local variations are often not reflected.

4.2.3 Blast P-686-29

The blast is located halfway between section 3600 and 3750. Its shape is more square like. This blast is influenced by the geology of both section 3600 and 3750. It is composed of hematite layer 7 and 9 and of amphibolite, layer 10 (see Figure 4.5).

We used a grid of 6 x 5 x 2 points to discretize the blast . A total of 44 points fell inside the blast contour.

The results are shown in table 5. The estimated

Layer	%Fe Kriging STD	WREC Kriging STD	Ore proportion in blast
7	31.67% 2.09	42.52% 3.24	30.95%
9	24.33%	27.66%	30.95%
Total	28.00% 1.56	35.09% 2.44	61.90%
Actual figures	28.5%	35.9%	67.13%

Table 3: Estimated results of Blast P-700-43

Layer	%Fe Kriging STD	WREC Kriging STD	Ore proportion in blast
7	34.98% 2.24	47.12% 3.46	63.3%
Total	34.98% 2.24	47.12% 3.46	63.3%
Actual figures	27.6%	34.7%	63.4%

Table 4: Estimated results of Blast P-700-42

Layer	%Fe Kriging STD	WREC Kriging STD	Ore proportion in blast
7	24.48% 3.08	29.09% 4.81	77.27%
9	17.86% 4.61	21.81% 7.11	4.55%
Total	24.12% 2.92	28.69% 4.56	81.82%
Actual figures	25.5%	30.2%	84.77%

Table 5: Estimated results of Blast P-686-29

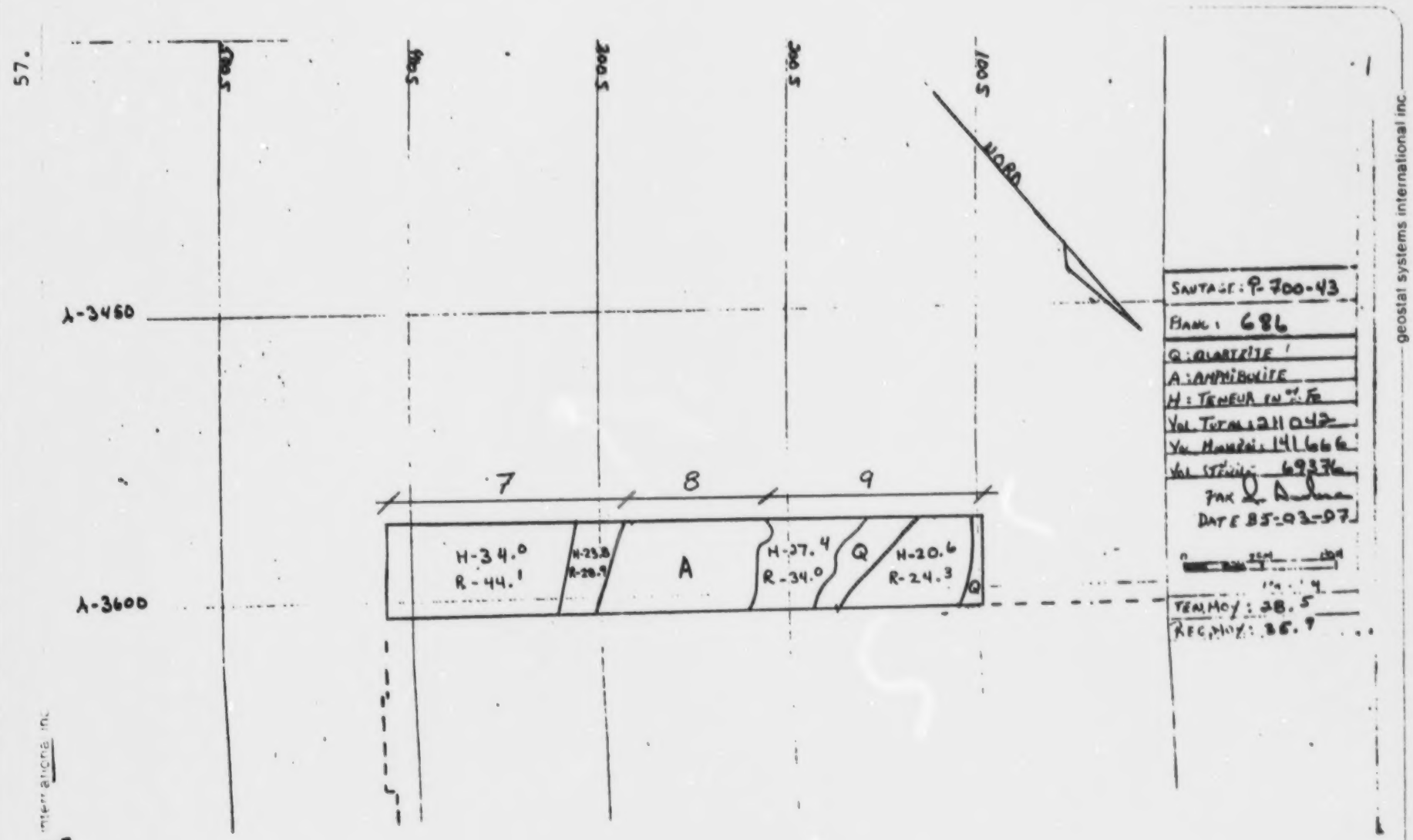


Figure 4.3: Location map of blast P-700-43

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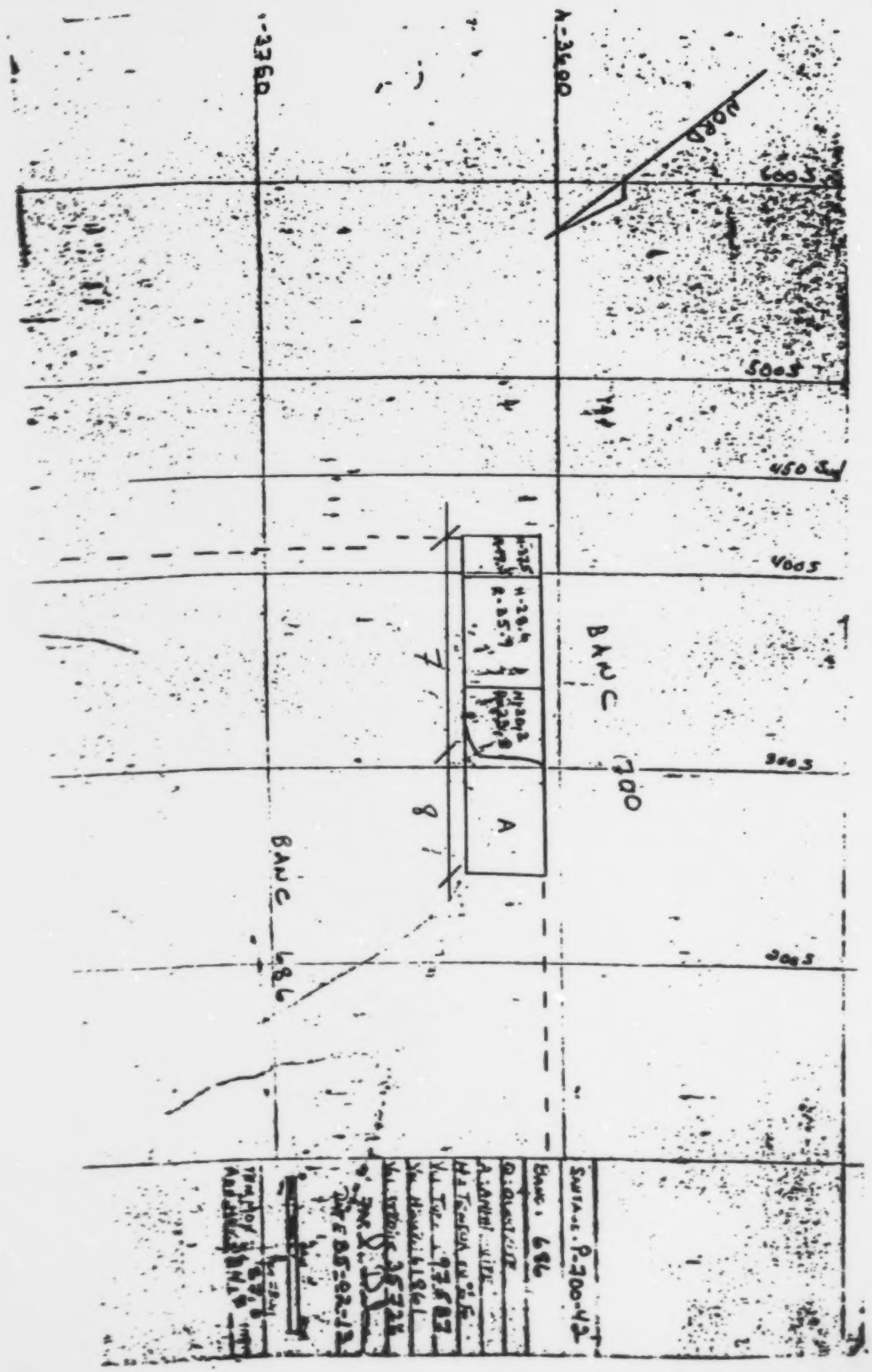

Figure 4.4: Location map of blast P-700-42

geostat systems international inc.

proportion of ore in blast is very similar to the actual figure (81.8% against 84.8%). The grade results are also very similar.

4.2.4 Blasts P-686-27,28,30-33

We grouped all those six blasts together in this section because they show very similar results and because they were discretized the same way.

The location of those blasts is presented in figures 4.6 to 4.11. They all lie between section 3600 and section 3900.

All the blasts were discretized using a grid of 15 x 2 x 2; 60 points in total.

The estimation results for this group of blasts are shown in Table 6.

Those six blasts show fairly well correlated Fe and weight recovery values. The ore proportion does not match as well. This is certainly due to the geology model that is not as accurate as the one outlined by the blast holes.

BLAST	LAYER	%Fe Kriging STD	WREC Kriging STD	Ore proportion in blast
P-686-27	7	23.28% 2.87	27.72% 4.49	86.67%
	9	17.52% 4.04	21.69% 6.20	13.33%
	TOTAL	22.60% 2.55	26.92% 3.98	100%
	ACTUAL	20.9%	24.7%	95.49%
P-686-28	7	25.88% 2.62	31.57% 4.09	50%
	9	26.07% 2.69	32.22% 4.11	50%
	TOTAL	25.98% 1.88	31.90% 2.90	100%
	ACTUAL	24.9%	30.3%	80.0%
P-686-30	7	26.78% 2.86	32.65% 4.45	53.3%
	TOTAL	26.78% 2.86	32.65% 4.45	53.3%
	ACTUAL	27.9%	35.0%	89%

Table 6: Estimated results of blasts P-686-27,28,30-33

BLAST	LAYER	%Fe Kriging STD	WREC Kriging STD	Ore proportion in blast
P-686-31	7	26.84% 3.35	32.86% 5.24	26.67%
	9	23.46% 2.32	28.08% 3.59	73.33%
	Total	24.36%	29.36%	100%
	ACTUAL	1.92	2.98	80%
P-686-32	7	24.61% 2.06	29.22% 4.78	85.2%
	9	24.33% 4.98	28.48% 7.86	7.4%
	Total	24.59% 2.85	29.16% 4.82	92.59%
	ACTUAL	22.6%	26.9%	58%
P-686-33	9	26.79% 2.45	33.13% 3.78	73.33%
	Total	26.79% 2.45	33.13% 3.78	73.33%
	ACTUAL	24.2%	29.5%	87%

Table 6: Cont'd

Figure 4.5: Location map of blast P-686-29

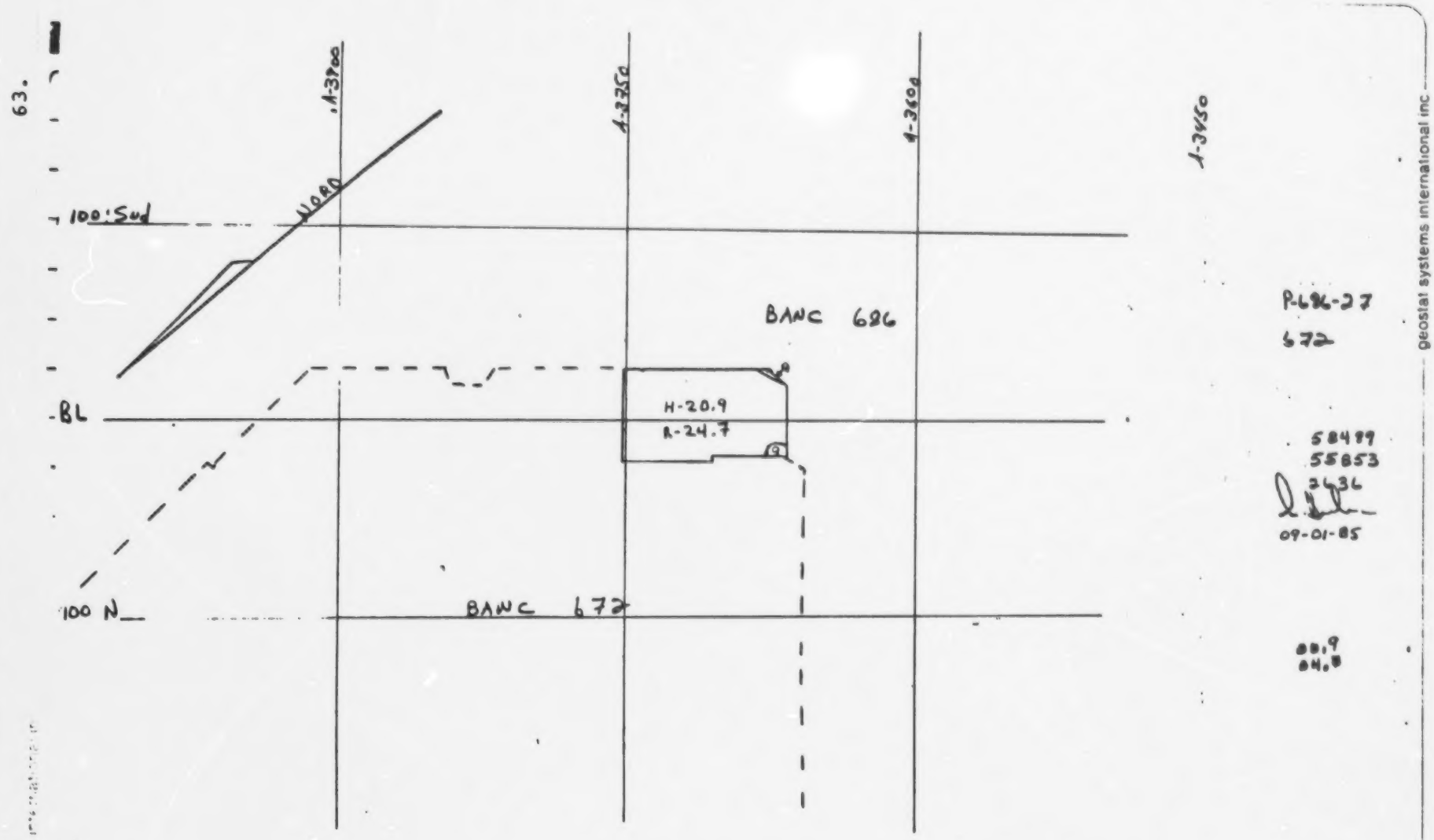

Figure 4.6: Location map of blast P-686-27

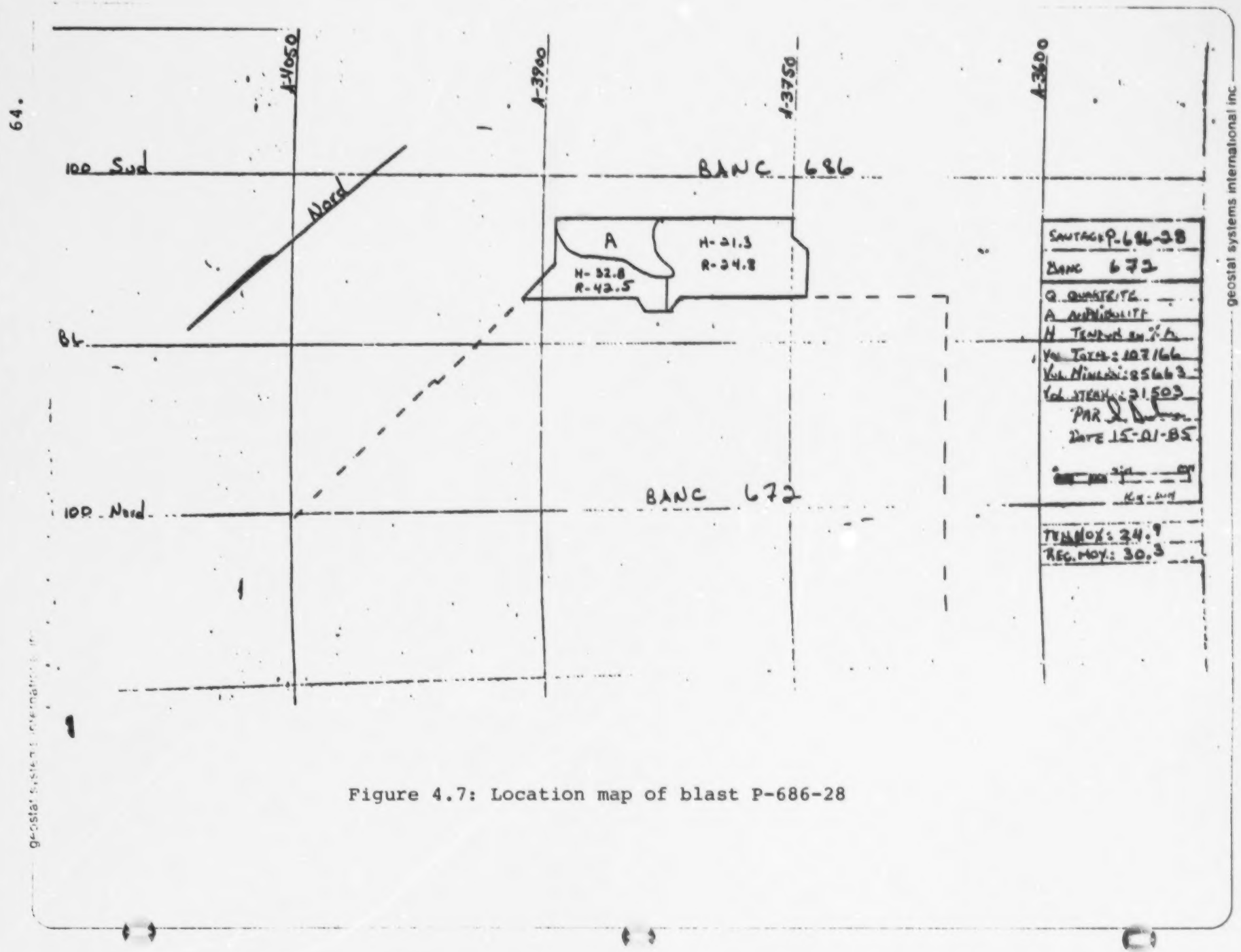

Figure 4.7: Location map of blast P-686-28

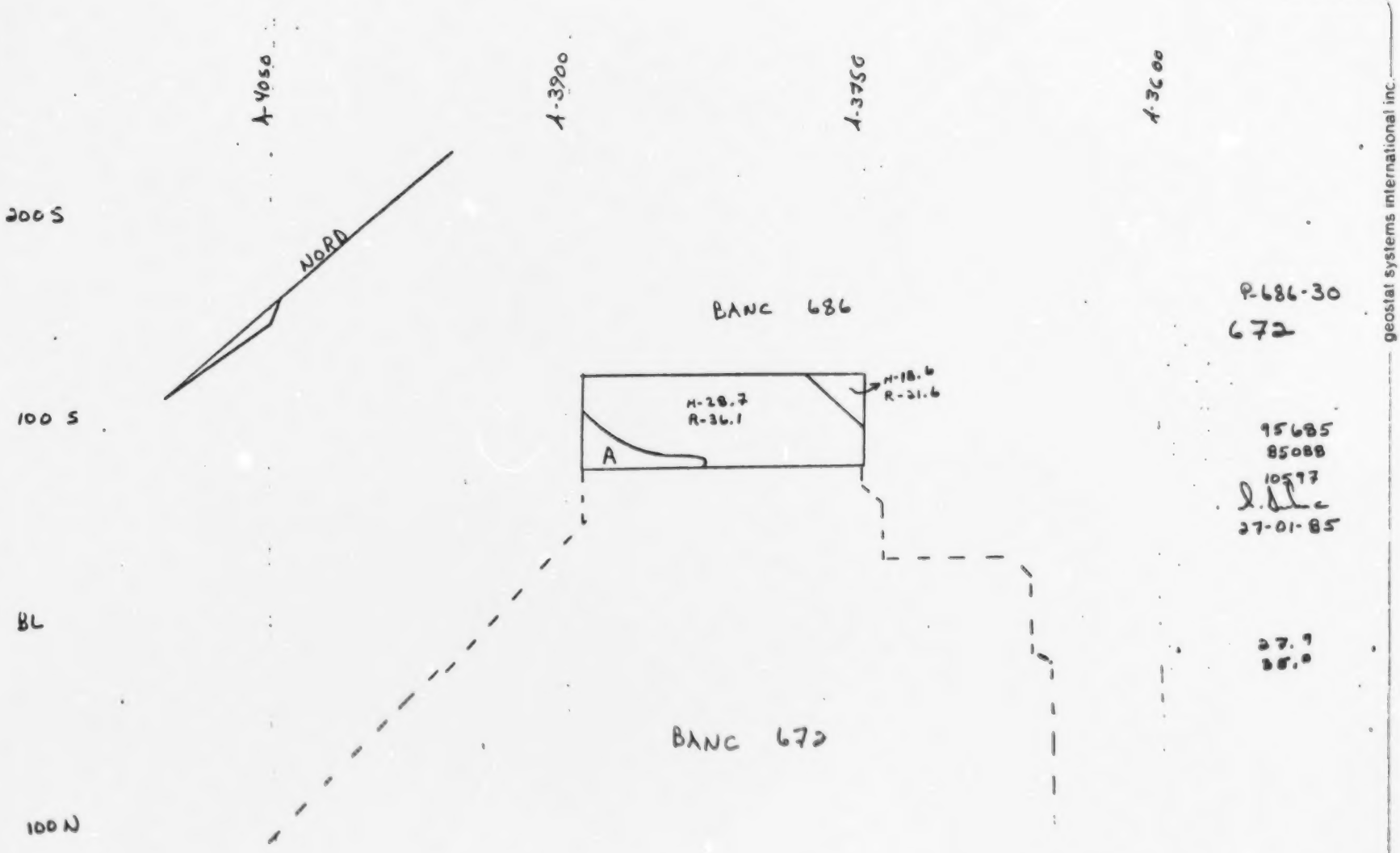

Figure 4.8: Location map of blast P-686-30

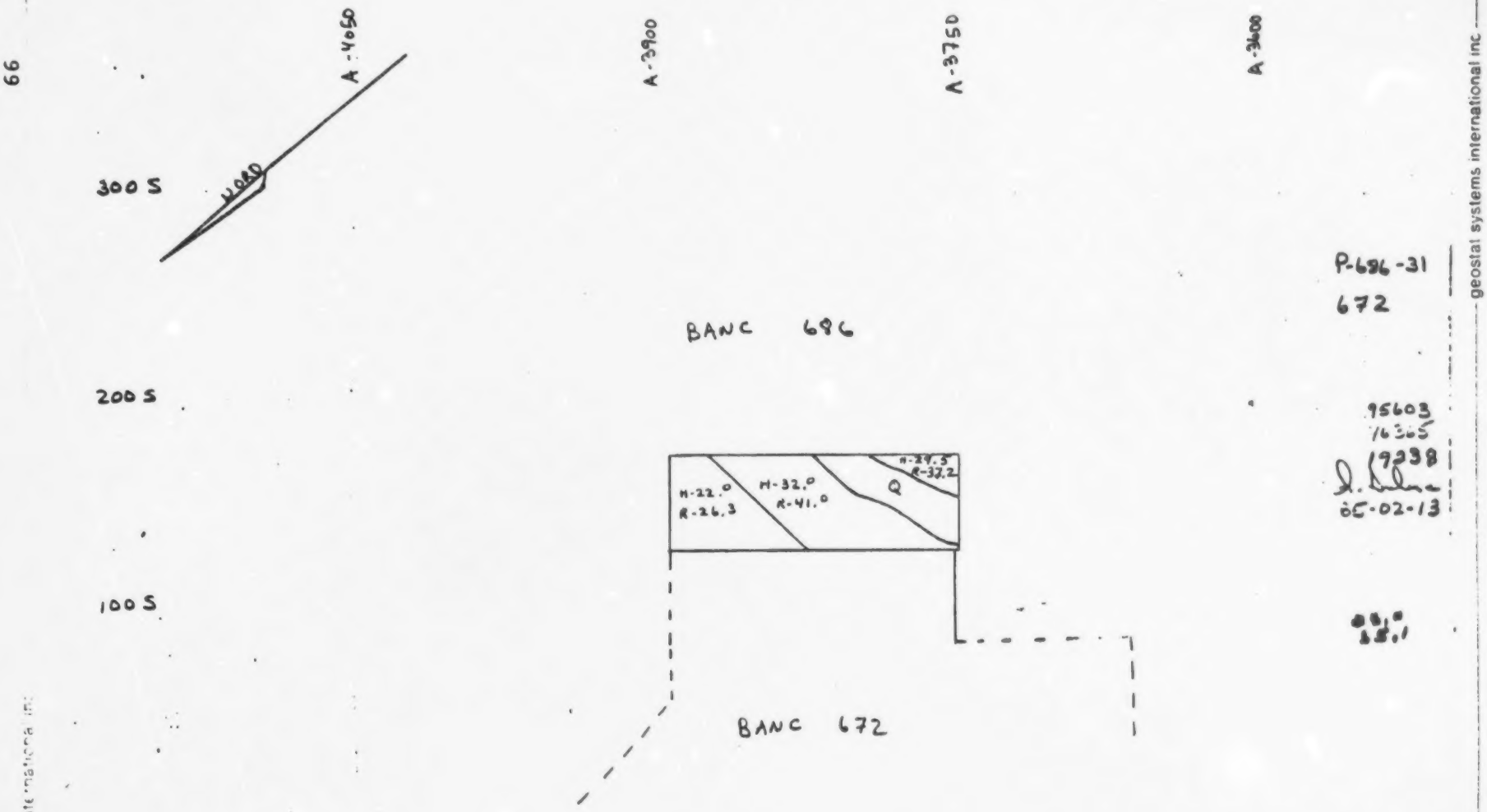

Figure 4.9: Location map of blast P-686-31

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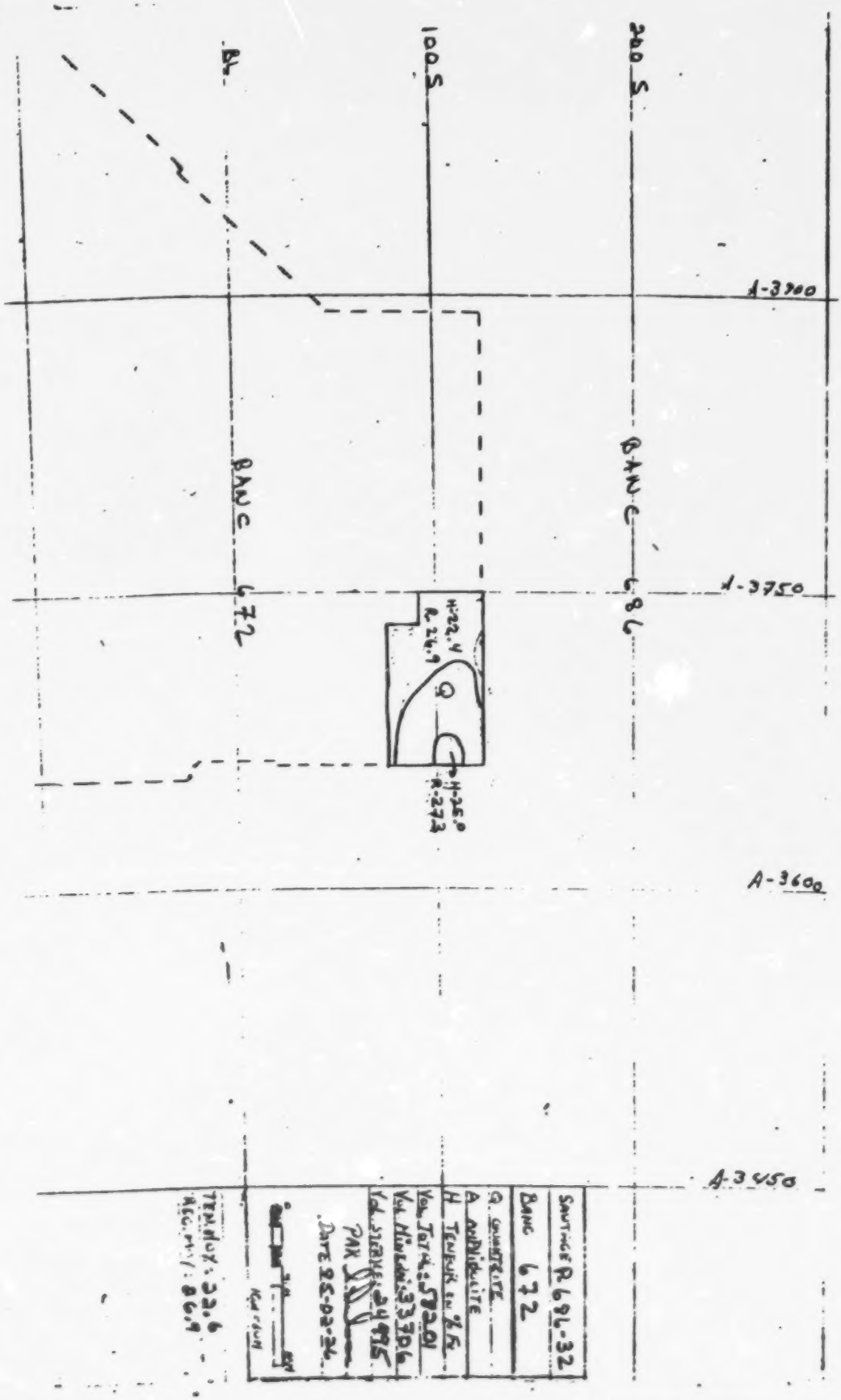


Figure 4.10: Location map of blast P-686-32

geostat systems international inc

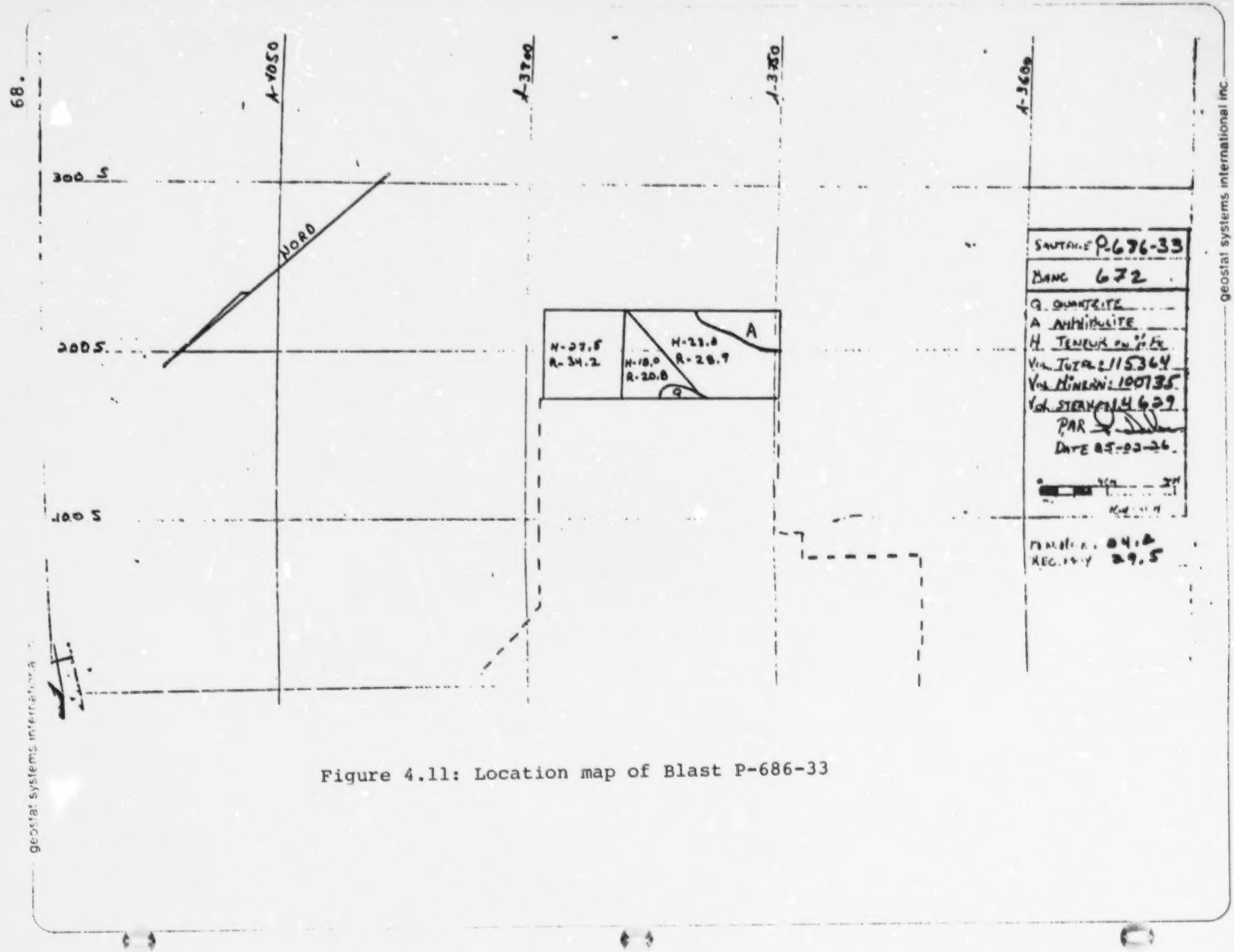


Figure 4.11: Location map of Blast P-686-33

5 - BLAST SAMPLING STUDY

5.1 Introduction

The actual grade of a blast is often taken as the mean of sampled blast holes. Since the holes are drilled at a very small scale, it is believed that the mean of sampled blast holes is almost equal to the truth.

But how many holes should one sample in order to produce a reliable estimate of the true grade of the blast?

In that exercise we will see the effect of the number of blast holes sampled on the error of estimation of a blast.

5.2 Methodology

When one assigns to a blast the mean grade of a certain number of blast holes, an estimation is done much the same way the polygonal method does. Because of the small size of the blast holes grid, the result is often very close to reality. Since it is an estimation, there is an estimation error involved and it closely relates to the number of holes involved.

Using the kriging procedure described in section 4 we will estimate blast P-700-43 using ficticious samples that we are going to create. They will be located inside the blast on a grid very similar to the blast hole grid: 8m x 8m. They will simulate the blast holes. Kriging the

blast with these samples will be our way to assign a grade to the blast. We will repeat the same exercise with various number of samples, taking all the samples one every two, one every four, one every eight, etc. We will then be able to compare the variances of estimation in each case. The smaller the variance of estimation, the more chances we have to be very close to the true grade.

The blast volume is numerically defined by a grid of points of 13 x 75 x 1. The points are set in one level only, like the real blast holes and are closely spaced in order to reach a good level of accuracy.

The blast holes are created on a 8x x 8m grid, making a 6 x 40 x 1 grid points. This is similar to the actual blast hole pattern.

The blast P-700-43 is made of ore layers 7 and 9. Both layers will be estimated separately and the estimation variance will be recombined.

5.3 Results

The results are shown in Table 7. They show for each sampling pattern and for each layer the % Fe kriging STD and WREC kriging STD. The last two columns show combined kriging STD of % Fe and WREC.

We can see that the first four patterns give standard errors of estimation for %Fe which are of the order of 1% of less.

There is a considerable jump when we only sample four holes in each layer. The standard error of estimation more than doubles from 1.28 to 2.68 %Fe.

The standard error of estimation steps even more when one samples one or two blast holes in each layer only.

5.4 Recommendations

In the light of the results, we would recommend that the sampling pattern be at least four blast holes samples per layer with best results with a pattern of 1 over 8 blast holes (around 11 blast holes per layer). This would help getting a better reconciliation between mine and mill production figures.

BLAST SAMPLING PATTERN	# 7 % Fe KR. STD	# 7 WREC KR. STD	# 9 % Fe KR. STD	# 9 WREC KR. STD	TOTAL %Fe KR.STD	TOTAL WREC KR.STD
All (78)	0.56	0.82	0.56	0.82	0.40	0.58
1 over 2 (39)	0.84	1.25	0.84	1.25	0.59	0.88
1 over 4 (21)	1.24	1.86	1.23	1.85	0.87	1.31
1 over 8 (11)	1.79	2.69	1.83	2.75	1.28	1.92
4 random	3.41	5.24	4.13	6.43	2.68	4.14
2 random	5.68	8.71	4.73	7.25	3.70	5.67
1 random (A)	7.59	11.59	7.12	10.91	5.20	7.96
1 random (B)	7.00	10.74	6.80	10.45	4.88	7.49

A: Hole located at the edge of the blast

B: Hole located in the middle of the blast

32% of the blast has been estimated as layer 7

32% of the blast has been estimated as layer 9

Table 7: Results of the blast sampling pattern study

APPENDIX 1

Manuals of the IBM PC programs used in this study. Programs are:

DIGIT

COMPOS

HISTO

VARIO3

BLAST

UNFOLD

KRIBLAST

GEOSTAT SYSTEMS INTERNATIONAL INC.

D I G I T

A DIGITIZER INTERFACE FOR IBM
PERSONAL COMPUTERS

VERSION 4.1

Montreal, April 1985

INTRODUCTION:

DIGIT is a BASIC program which is designed to run on any IBM PC, XT, AT or other PC compatible with a graphics screen. It reads point coordinates from a digitizer, and allows on screen editing of the point file created. **DIGIT** will also allow the addition of a "Z" value to the X,Y coordinates either as a constant, (contours, geological boundaries, pit limits...), or as a unique variable which changes with each data point (samples, drill holes, blast holes...).

In this version, **"Z"** is a sequence of up to 255 characters or numbers. For example, **"Z"** would be:

- an assay value,
- several assay values,
- a bench number,
- a rock type code,
- the name of property,
- any combination of the above.

DIGIT displays the points on the graphics screen either as individual points, or as the vertices of a traverse, and the coordinates of each point **(X,Y,Z)** can be displayed. **DIGIT** will calculate the area contained within a traverse using the double meridian distance (DMD) formula, and can record the areas for use in later calculations.

HOW TO GET STARTED:

Two files must exist within your work area to run **DIGIT**. These are:

DIGIT.EXE
CONFIG.DIG

The digitizer may be plugged into the COM 1 or COM 2 port of the IBM PC. This is controlled by the **CONFIG.DIG** file, which looks like this:

```
CAL,2
CAL,1200,O,7,1,3,8,5,12
HI,4800,N,7,2,2,8,6,13
SUM,1200,E,7,2,3,9,6,14
```

The first line controls which brand of digitizer is being used, and which serial communications port is being used. The following lines control the communications parameters used with the specific digitizers.

The three digitizers currently supported by **DIGIT** are:

Calcomp	**CAL**
Houston Instruments	**HI**
Summagraphics	**SUM**

The second parameter on line 1 will be either 1 or 2 depending on whether **COM 1:** or **COM 2:** is being used

The remaining lines control the communications parameters for each brand of digitizer. The parameters are:

BRAND,BAUD RATE,PARITY,DATA BITS,STOP BITS,IX,IY,LNGTH,ILNGTH

Where:

- IX = The starting location of the X coordinate in the string sent from the digitizer.
- IY = The starting location of the Y coordinate in the string sent from the digitizer.
- LNGTH = The length of the portion of the string representing each of the coordinates.
- ILNGTH= The length of the total string accepted for each pair of coordinates.

With the required two files in your directory or work area type the command:

DIGIT <cr>

This will load the program into memory and set the keyboard function keys to the appropriate functions. The computer will then echo the selected digitizer brand and serial port on the screen.

CHOICE OF ENTRY MODES:

You now have the opportunity to choose the manner in which data is entered and displayed on the screen.

XY or **XYZ** gives you the option to enter two cartesian coordinates X and Y or two coordinates associated with a Z-value X,Y and Z. If **XY** is chosen the computer will expect a new point to be entered from the digitizer until you type "q" for quit and enter the next point. If **XYZ** is chosen the computer will assume a constant Z value of 0 (zero) until it is changed to another constant (for example: to digitize an iso-line) or to a variable with the "Z" command.

****NOTE****

The screen representation of the data shows points in relative positions. The scale and the X-Y offsets are not necessarily true. The screen is meant to be used as a visual aid while the true coordinates of the points are stored in a data file.

INITIALIZATION:

The computer will then request that a point be entered from the map, and it will prompt for the entry of the X and Y coordinates of this point from the map. Enter these from the keyboard, separated by a comma. For example:

23400,19875

You will be requested to enter two more points in the same manner. This allows the computer to calculate the map scale, the rotation of the map on the digitizer board, and any distortion between the axes of the map (such as "blueline stretch"). The computer will return the scale values in the X and Y directions and the origin coordinates to the screen for your approval. If they are not correct you may enter the three points again.

****NOTE****

The program assumes that the first of the three points entered is the local origin. The screen is scaled assuming that the three points entered include the origin, which is the minimum value on both the X and Y axes, the maximum value of the X axis, and the maximum value of the Y axis. Thus points at the extremes of both axes will fall near the edge of the screen.

POINT TRAVERSE DISPLAY:

The computer then prompts for the choice of **Point** or **Traverse** display mode. This only affects the screen display and can be changed at any time. (See **POINT-TRAVERSE** in the command list below)

DIGITIZING COMMANDS:

The user may begin the entry of points from the digitizer. Points may be entered at any time except when the program is in the show/edit mode (see **SHOW** command). Striking the F1 key will bring up the help menu.

HELP MENU

```
H or F1 --- HELP MENU
L  -------- LOAD EXISTING FILE
K or F2 --- SAVE
Q or F4 --- QUIT
S  -------- SHOWS LINE SEGMENT
C  -------- CHANGES A POINT
I or F9 --- INSERTS NEW POINT
D or F10 -- DELETES A POINT
B  -------- REINITIALIZE MAP SETUP
O  -------- DISPLAYS DIGITIZER PARAMETERS
R or F3 --- REDRAWS THE TRAVERSE
A  -------- CALCULATE AREA OF TRAVERSE
P  -------- SET POINT-TRAVERSE MODE
Z  -------- CHANGE Z CONSTANT
U  -------- MOVES THE SCREEN ORIGIN
V  -------- CHANGES THE SCREEN SCALE
M  -------- MERGES SEVERAL FILES
```

These commands can be executed either by typing the letter code or the function key corresponding to the command.

HELP Displays the help menu (NOTE if the program is in **SHOW** mode a different menu is displayed than in command mode).

LOAD Allows loading a previously created file from disk into memory. Each created file may contain a maximum of 7000 digitized points.

SAVE Saves the point coordinates and values in a disk file without quitting the digitizer program. (see also output file format).

QUIT Ends the program, saves the digitized points in a disk file, and returns to the operating system.

SHOW Indicates a point on the screen by flashing the point (if in point mode) or the line to the point (if in traverse mode). The coordinates and value of the point are displayed in the upper right hand corner of the screen.

The editing commands (**CHANGE**, **INSERT**, ...)can be accessed from the **SHOW** mode. The flashing point can be changed by typing "S" again and entering the point number. (See below under **SHOW** mode).

CHANGE Changes the z-value and position of the point that is flashing (see **SHOW** command) or of a point of your choice (referred by its number).

INSERT Inserts a new point sequentially before the flashing point or any point of your choice (referred by its number).

DELETE Deletes the flashing point .....
***** Deletes all digitized points in memory
I-J Deletes points I to J
Q Quit deleting mode

REINITIALIZE Allows resetting the coordinates on the map while staying in the same file. This feature can be used to reset the map if it moves relative to the digitizer board or to move a map that is larger than the digitizer and effectively increase the size of the board

PARAMETERS Displays the map coordinates of the point that was initialized as the local origin, and displays the scale of the map in units/inch for both the X and Y axes.

REDRAW Clears the screen and redraws the point locations or the traverse. This is useful if another command has inserted something into the screen.

AREA Calculates the area of the polygon enclosed by the traverse assuming a closure to the first point digitized. If there are different Z-values (such as isolines) the area is calculated for each Z and summed. When the area is displayed the prompt SAVE AREA? will appear, a "Y" response will return the prompt AREA CODE and the area and perimeter will be appended to file "AREA.PRN". This facilitates importing the file into LOTUS 1-2-3.

POINT-TRAVERSE Point or Traverse mode affects only the manner that the data is displayed on the screen. If point mode is chosen the points are represented on the screen by crosses ("+") in their relative location to each other. If traverse mode is chosen the points are represented as the vertices of a polygon with lines connecting the points.

****NOTE**** The use of point mode is recommended for entering drill hole and sample data while traverse mode is recommended for representing boundaries (property lines, roads, faults, etc.)

CHANGE Z Changes Z-value from one constant to another, or if "V" is entered makes the Z a variable which must be entered from the keyboard with each point entered from the digitizer.

The Z-value is a string variable. Hence any sequence of characters or numbers can be entered with a maximum length of 255 characters.

Constant Z-value (for example):

MB. PROJECT LEVEL 400 CURVE 10

==> This type of Z-value can be used if one is digitizing a contour or isoline on a level map. Command Z is entered each time a new curve is digitized.

Variable Z-value (for example):

```
    100.50     200.99 1.50 2.33 3.70
\_________/\_________/\_______________/
     X          Y         Z-VALUE
```

==> A variable Z-value will be useful when entering drill hole or sample data. For each location, the user enters as a Z-value the drill hole name or sample data as sample length and grades. In that case, Z command is activated only once and the V parameter is entered.

SCREEN ORIGIN Allows movement of the window that is shown on the screen defined by the first three points entered. The program assumes that the origin is in the lower left hand corner of the screen.

SCREEN SCALE Changes the scale of the screen without affecting the true map scale. This allows a larger portion of the map to be viewed on the screen or a smaller portion to be viewed in greater detail.

MERGE This command allows the user to merge several (up to 20) previously saved files into one file. The program prompts the user for the number of files to be merged and their corresponding filenames. The user is then asked to enter the filename under which the files will be merged.

SHOW OR EDITING MODE:

The **SHOW** mode is to assist in editing the point file by flashing the relative location of a point on the screen and displaying the coordinates and Z-value of that point on the screen. Commands such as **CHANGE** and **INSERT** can be executed on the flashing point. Striking the **F1** key will bring up the help menu for the edit mode.

SHOW HELP MENU

```
C  ------- CHANGES A POINT
I or F9 -- INSERTS NEW POINT
D or F10 - DELETES A POINT
F5 ------- BACKS UP ON TRAVERSE
F6 ------- ADVANCE ALONG TRAVERSE
F7 ------- MOVES TO FIRST POINT
F8 ------- MOVES TO LAST POINT
R or F3 -- REDRAWS THE TRAVERSE
H or F1 -- HELP MENU
Q or F4 -- QUITS SHOW
```

HELP	Shows the help menu for **SHOW** mode.
CHANGE	Changes the value and position of the point that is flashing (see **SHOW** command) or of a point of your choice
INSERT	Inserts a new point sequentially before the flashing point or at the point of your choice.
DELETE	Deletes the flashing point .....
REDRAW	Redraws the screen display (see description above)
SHOW	See command above.
QUIT	Returns to normal digitizing status.

OUTPUT FILE FORMAT:

When **XY** entry mode is chosen the digitized points coordinates are written to the file with a **2F10.2** format.

With the **XYZ** entry mode there are two possible output formats depending on the status of "**Z**":

-- CONSTANT Z

In this case, the Z-value, preceded by code number **1**, will be written at the beginning of each group of digitized points having the same Z-value. Each **XY** coordinates are written on the following lines with the code number **2** in a **2F10.2** format. This output file can be processed by the **GENL3D** program to create a block limit file based on digitized limits.

```
1<Z-value>
2    X     Y
2    X     Y
2    X     Y
2    X     Y
1<Z-value>
2    X     Y
2    X     Y
     ......
```

-- VARIABLE Z

As in the case of **XY** entry mode, each **XY** coordinates are written with a **2F10.2** format and are immediately followed by the corresponding Z-value.

```
X     Y<Z-value>
X     Y<Z-value>
X     Y<Z-value>
X     Y<Z-value>
X     Y<Z-value>
     ......
```

This is exactly the format of a sample or composite file that can be processed directly by many **GSII'S** programs, (PLOT2D, HISTO, VARIO3, KRIGE3, POLYGN...).

Remember that **DIGIT** has an option to merge up to 20 files of digitized points coordinates. This option is useful when you digitize limits or samples on several different sections or level maps and you wish a single file for all your data.

GEOSTATISTICAL RESEARCH GROUP

COMPOS

A PROGRAM FOR COMPOSITING
DRILL HOLE ASSAY INTERVALS

VERSION 2.1

IBM-PC/XT DOS: V1.1/2.0

GEOSTAT SYSTEMS INTERNATIONAL INC.
Montreal, January 1984

COMPOS INSTALLATION GUIDE

Now that you have received our diskette with the **COMPOS** program, please read these few instructions before using it:

COMPOS ORGANIZATION

COMPOS is made of the following files:

COMPOS.BAT: small command file which controls the editing of controls and execution of program

MCOMPOS.EXE: program to control the editing of controls with full screen menus

GEOSTAT.EXE: application program itself. It reads the control and input data file(s) and produces all the output files including those for the printer and the plotter

HARDWARE SPECIFICATIONS

COMPOS runs on IBM PC, XT, AT or compatibles with DOS (Disk Operating System) version 2.0 and following. A minimum of 256K of machine resident memory is necessary. We may accommodate a smaller memory size. Please contact your GSII representative.

COMPOS also needs a numerical coprocessor (8087 or 80287) on the board to run successfully. A special version for machines without that chip can be prepared on request.

COMPOS can run on machines with only two floppy disk drives. A hard disk is recommended however.

INSTALLATION OF COMPOS ON A HARD DISK

The **COMPOS** program that you received has been designed to run from the original diskette without any particular installation procedure. However, if you have a hard disk, you can install some of the program modules on it and run them from there without having to manipulate diskettes. In order to do that we suggest the following procedure:

+ on your hard disk, create a directory with the name GSIPROG. Make sure that the hard disk is the default drive (the prompt should start with C>). Then enter the DOS command:

MD GSIPROG

+ next, you go to this directory with the DOS command:

CD GSIPROG

(Note: if you have specified PROMPT PQ$G before or if you have this command in your AUTOEXEC file, the prompt on your screen should now be: C:\GSIPROG=>

+ take your write-protected diskette of **COMPOS** and place it in drive A

+ copy the command file of **COMPOS** from the diskette to the hard disk with the DOS command:

COPY A:COMPOS.BAT

+ copy the control editing module of **COMPOS** from the diskette to the hard disk with the DOS command:

COPY A:MCOMPOS.EXE

+ copy the application program itself from the diskette to the hard disk. Now, we will change its name on the hard disk to avoid any confusion with other GSII programs that you may want to install in the same way. The DOS command to use is:

COPY A:GEOSTAT.EXE CCOMPOS.EXE

Once this operation is completed you should have on the GSIPROG directory of your hard disk the following files (you can check it with a DIR command): COMPOS.BAT, MCOMPOS.EXE, CCOMPOS.EXE. You can now remove the diskette from the drive and store it in a safe place since you no longer need it.

The last operation is the editing of the COMPOS.BAT file to reflect the new organization of your program. You can use any editor that you are used to on your machine or the EDLIN editor of DOS. Changes are:

line 3: change "**A:MCOMPOS**" into "**MCOMPOS**"

line 6: change "**A:GEOSTAT**" into "**CCOMPOS**"

Note: if you wish to be able to run **COMPOS** from any directory of your hard disk, we suggest that you include the following DOS command in your AUTOEXEC file: **PATH = C:\GSIPROG**

RUNNING THE DEMO CASE

COMPOS is supplied with data files to let you reproduce a demo case that is described in the last section of this manual. There is a control file **COMPOS.CTL** and data file **DHDAT1.DAT.** The procedure to run the demo depends of the installation of the program.

+ Running the demo case from the original diskette

Take the original diskette, remove the write protection tab and insert the diskette in drive A. You can "boot" directly on the diskette if your machine is off (in that case, make sure that drive **A** is closed and simply turn the machine on) or you enter: **A:COMPOS.**

On your screen, you get a banner with the program name and version number. Press any key and you get a "Main Menu" on the screen. At that point you may want to look at the controls for the demo case in file **COMPOS.CTL** using option 2 (see section on control menus below). If you have a color monitor, you may also try option 5. However, to run the demo case, you need use option 1 (for **EXECUTE**). At that point the menu disappears fromthe screen and after a while another banner with program name and version number shows up. It is immediately followed by the following prompt:

ENTER PRINTER OUTPUT FILE: [FORO6.DAT]

For this demo case, we suggest that you enter **USER** inorder to see the printout of the execution of the program on the screen. Then you see the banner a second time and the next prompt is:

ENTER CTRL PARAMETER FILE

Enter: **A:COMPOS.CTL**

Next prompt is:

ENTER MAIN DATA FILE

Enter: **A:DHDAT1.DAT**

Next prompt is:

ENTER OUTPUT DATA FILE:

Place a blank formatted diskette in drive B and enter:

B:COMP3D.DAT

At that point, you start seeing the printout of the execution on the screen. If it goes too fast, you can stop it by pressing the **<CTRL>** and **<S>** keys at the same time. Press the same two keys to resume execution. When everything is finished the message **"Stop - Program terminated"** appears on the screen and soon you are back to the original welcome banner. Press any key to get to the main menu again. Then select option 4 to get back to the DOS operating system. Remove the diskette from the drive and put write protection tab back on it.

Note: If you do not want to write on your original diskette, printer or any output files can be stored on a diskette in a second floppy drive or your hard disk (e.g. **B:COMPOS.PRT** or **C:COMPOS.PRT** instead of USER for the printer output file.

+ Running the democase from the hard disk

We assume that you have installed the programs on the directory **GSIPROG** of your hard disk as explained before. The default drive is the hard disk (prompt C>). If you do not have a path to **GSIPROG** in your AUTOEXEC procedure, you need get to that directory before you start the procedure with the DOS command:

CD GSIPROG

In both cases, you start by entering: **COMPOS**

On your screen, you get a banner with the program name and version number. Press any key and you get a "Main Menu" on the screen. At that point you may want to look at the controls for the demo case in file **COMPOS.CTL** using option 2 (see section on control menus below). If you have a color monitor, you may also try option 5. However, to run the demo case, you need use option 1 (for EXECUTE). Before you do that, make sure that you have the original diskette in drive A. You do not have to remove the write protection tab however. Menu disappears from the screen and after a while another banner with program name and version number shows up. It is immediately followed by the prompt:

ENTER PRINTER OUTPUT FILE: [FORO6.DAT]

For this demo case, we suggest that you enter **USER** in order to see the printout of the execution of the program on the screen. Then you see the banner a second time and the next prompt is:

ENTER CTRL PARAMETER FILE:

Enter: **A:COMPOS.CTL**

Next prompt is:

ENTER MAIN DATA FILE:

Enter: **A:DHDAT1.DAT**

Next prompt is:

ENTER OUTPUT DATA FILE:

Enter: **COMP3D.DAT**

At that point, you start seeing the printout of the execution on the screen. If it goes too fast, you can stop it by pressing the **<CTRL>** and **<S>** keys at the same time. Press the same two keys to resume execution. When everything is finished the message **"Stop - Program terminated"** appears on the screen and soon you are back to the original welcome banner. Press any key to get to the main menu again. Then select option 4 toget back to the DOS operating system.

RUNNING YOUR OWN CASE

The procedure is the same as for the demo case except that you need supply your own control and input data files. You can use options 2 and 3 of the main menu to generate your own control files (see below). Input data file can be on diskette or hard disk. Make sure that you always use the right device identifier when you answer the prompts (e.g. **B:MYFILE.DAT** if input data is on drive B).

EDITING CONTROLS THROUGH MENU PROCEDURE

Controls for the execution of the **COMPOS** program are set in a small input file called the control parameter file (**COMPOS.CTL** for the democase). A full description of the parameters in this file is given in the section "Control Card Description" of this manual. Based on this description, you can use a text editor on your machine (like EDLIN of DOS) to set the controls in that file. The alternative is to use the menu facility supplied with the program. To do that, you just select option 2 (**"Edit a previous control file"**) or 3 (**"Create a new control file"**) of the program main menu. In the first case you are prompted for the name of the control file to edit. Then you get to the first page of the control editing menu. You will notice the cursor in the first field to be filled. Fill the field as required: hitting the **<RETURN>** key will bring the cursor to the next field, and so on.

If you wish to go down or up through a menu page without changing any parameter, use key arrow down and arrow up respectively.

At the bottom of the screen you see a choice of options in reverse video:

Escape, to return to the main menu

Page down, to get to the next page of the menu (for last page, to get back to page one)

Page up, to get back to the previous page (for page one, to get to the last page of the menu)

Replace or **Insert** mode, to know whether you are in insert or replace mode

Note that all the keys are active, for instance if after field 10 you realize that you made a mistake in field 5, you can get back there with the arrow keys.

The second page will appear automatically after the <**RETURN**> you entered after filling the last field of the first page.

If, when in the second page, you want to go back to page one, press <**PAGE UP**>. When you have finished entering all your values, press <**ESCcape**> key. You will then have to name the control file you have just created or edited. Make sure you do not choose a name already in existence unless you want to erase the old version of the control file. If you just edited an existing control file the name of this file is the default of the prompt.

If you do not want to keep the controls at all, press the <**ESCcape**> key a second time.

Once you have entered the name of the new control file and pressed the <**RETURN**> key, you are back to the main menu.

PURPOSE

COMPOS is a FORTRAN 77 computer program designed to create composites from drill hole information (grades, ppm, etc.). The program will handle any number of holes in a single run and the user defined memory requirements will determine the amount of information that can be processed.

The program enables the user to produce composites in either one of two modes: on a bench by bench basis (benches may be tilted in space) or on a hole by hole basis starting from the collar of each hole.

Several options are available that enable the user to specify the approach (type of compositing), the number of variables, the compositing function, etc.

INTRODUCTION

Data gathering in geology, particularly in phases of detailed exploration of an ore deposit is highly dependent upon geologic features and precisions required under economic constraints. Several intricate factors will determine sample length in diamond drill campaigns. Hence samples may be of different lengths, which need regrouping prior to a geostatistical study. Other reasons for sample regrouping in equal length units include bench or section cutting of a deposit into individual slices based on mining conditions forecasted.

Such core sample regrouping is commonly referred to as "compositing" of drill hole information. The regrouped samples are called composites and represent, or are considered to represent, equal lengths of sampling along boreholes.

The computer program herein described is entirely devoted to the generation of such composites starting from a raw drill hole data base, which for instance may be straight forward data retrievable for any standard drill log data sheet.

PRINCIPLES OF COMPOSITING

Because samples are of different lengths, the grades they are assigned do not represent the same quantity of mineralized material and hence, such samples are not directly comparable to one another for statistical purposes. The basic principle of compositing is to weight the contribution of the grade of a sample by the amount of material it represents (that is its length) in the generation of a given composite; such a weighting procedure may also include contribution of density (of interest for high density commodities) of samples.

For example, 2 pieces of consecutive drill hole lengths may assay as follows:

Piece 1	Length 1m	Cu grade = 2%
Piece 2	Length 2m	Cu grade = 1%

Obviously their corresponding grade spans through a different quantity of material. Compositing will then assign to the entire length of these 2 core pieces a new grade of 1.33% Cu over 3 meters.

APPLICATIONS

There are 2 basic ways to regroup samples in drill hole information. A brief description of how the program performs compositing is described below.

1) Compositing per bench (tilted or not)

In this case, a set of parallel but equally thick benches are set in the deposit, so as to include relevant information required. The thickness of a bench determines the length of the new samples or composites and compositing. Thus a sample intersecting two benches will be appropriately divided to assign its representation in each bench. All gaps, or missing information are treated according to the user specific needs. Different mining operations may require tilting of benches or even working in sections, this is also a standard specification of program **COMPOS**.

2) Compositing along boreholes

The use of benches may not be required in some deposits. In such cases, compositing is performed starting from the first sample in the drill hole and regrouping continues until the hole in its entire length has been processed. There again, samples are cut where needed and the relative contribution to the next composite, further down the hole is accounted for.

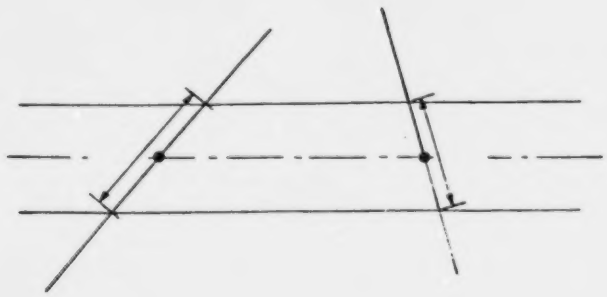
SAMPLE LENGTH REPRESENTATION PROBLEMS

Minimum representation

Very often in a drill hole file, gaps or unsample core lengths are found. The **COMPOS** program will not generate a composite whose total sampled length is below a basic minimum length (based on geologic/sampling reasons) which must be specified by the user. For example, such partial sampling will undoubtedly occur near the top and/or bottom of the drill hole.

INCLINED BOREHOLES WITH RESPECT TO BENCHES

The problem occurs when one is compositing holes in benches. Here the created composites represent different lengths of sampling if the holes are not parallel (figure 2).



Experience shows that this is not detrimental to statistical study provided an acceptable range of length is respected. The user must therefore be careful in the selection of the options and paramters of the program, particularly if extensive fan drilling has been used. A built-in limit of the program is to delete all composites that could be created from a drill hole section which is more than 80^{o} off the bench normal line.

HOLE DEVIATION DATA

Program **COMPOS** processes a complete hole from the collar to the bottom of its last sample.

When it encounters a change of direction (as indicated by a code 2 card), in the compositing process, it then re-evaluates the current composite position only if the "change" occurs before half of the composite length is reached; otherwise, it completes the work on that composite with the same position settings, and applies the shift in position only to the next composite.

INPUT FILE

Program **COMPOS** assumes the input file to be in the following format:

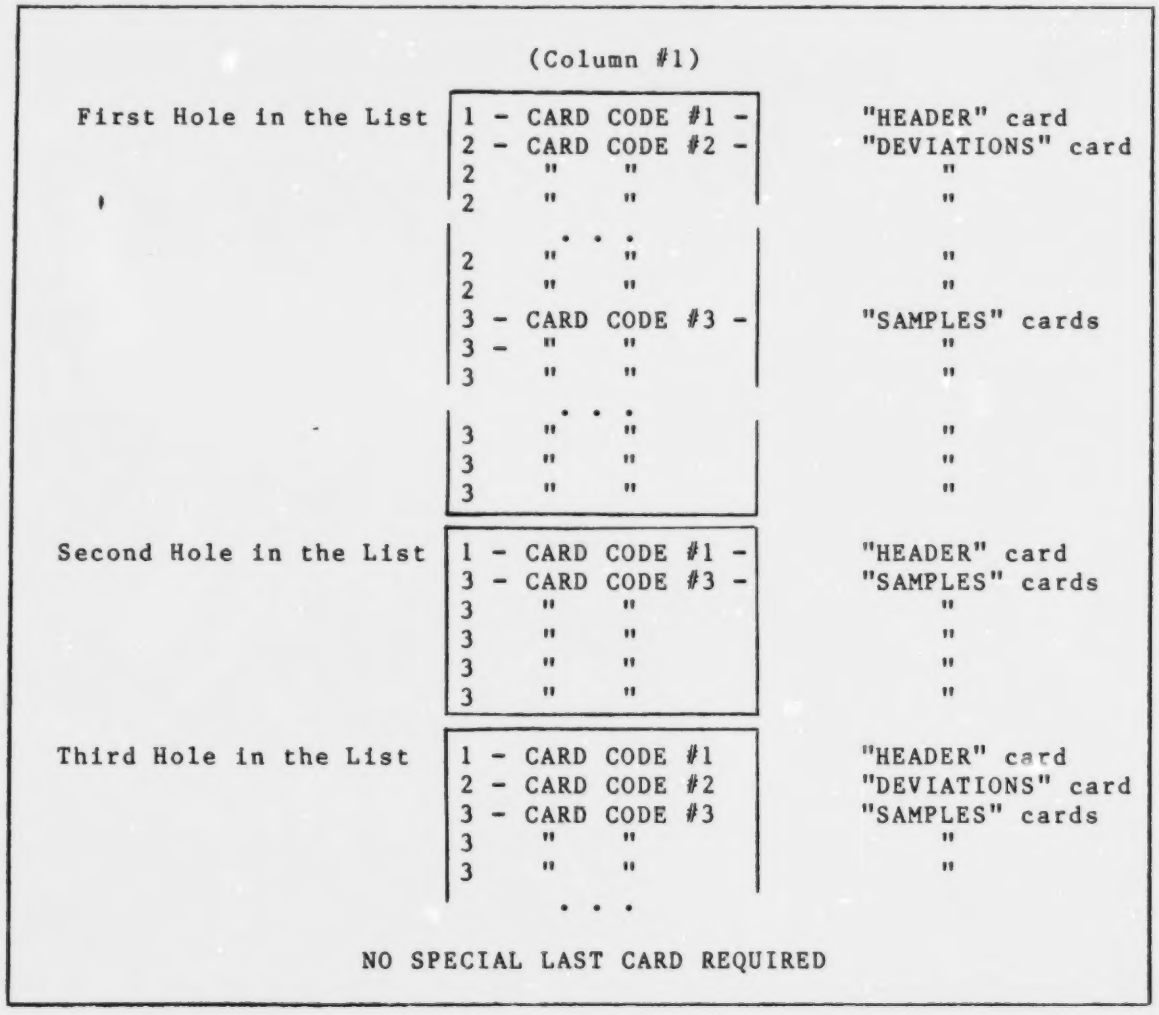


Figure 3

CARD CODE #1 Each hole has ONE and ONLY one "HEADER card". This card contains at least the following information:

ICODE,IHOLID,X,Y,Z,AZ,DIP

- ICODE: 1 (INTEGER)
  (Must be in column one)
- IHOLID: Bore hole identification (8 characters)
- X,Y,Z: Coordinates of collar
  (Easting, Northing, Collar elevation)
- AZ: Azimut (0°,360°) from North(Y), clockwise.
- DIP: Dip (-90°,$+90^{\circ}$) from horizontal, counterclockwise (geologic sense).

CARD CODE #2 Each hole may or may not have one or several "DEVIATION cards". If present, then each of these cards should have the following information:

ICODE,IHOLID,Z,AZ,DIP

- ICODE: 2 (INTEGER)
  (Must be in column one)
- IHOLID: User hole identification (8 characters)
- Z: Distance from collar where the acid test (or other) has been taken.
- AZ: Azimut (0°,360°) from North(Y), clockwise.
- DIP: Dip (-90°,$+90^{\circ}$) from horizontal, counterclockwise.

CARD CODE #3 Each hole MUST contain one or more "SAMPLE cards". Each of these cards must have the following information:

_ ICODE,IHOLID,FROM*,GR_1,GR_2,....,GR_{nvar},DENS,REC

- ICODE: 3 (INTEGER)
  (Must be in column one)
- IHOLID: User hole identification (8 characters)
- FROM,TO: Limit of the sample along the hole.
- GR1....: Grades (there should be NVAR grades)
- DENS: Density of the sample (1)
- REC: Factor for that sample (2) core recovery.

(*) If the samples are situated along the hole in the format:

"From-TO:	then	IFMT	should	be	set	to	0
"From-length"	"	"	"	"	"	"	1
"Center-length"	"	"	"	"	"	"	2

(see description in last section)

(1) If IDENS=1 then there should be a value "DENS" on each "SAMPLE" card. Otherwise not.

(2) If IREC=1 then there should be a value "REC" on each "SAMPLE" card. Otherwise not.

NOTE: The user may add as many holes as he wants in the Input File, according to the above hole format description for each and every hole.

HINT: The program skips all the cards with a "0" (zero) or a blank in the ICODE field (1st column). This may be useful if one wishes to insert comments in the Input File.

THE COMPOSITING FUNCTION

Over a certain length "L" (which determines the composite length), the samples are weighted with respect to the portion of that length (L) which they cover. The function used is the following:

$$C = \frac{\sum g_i * l_i}{\sum l_i}$$

where: g_i is the grade associated with sample "i"

l_i is the length covered by sample "i"

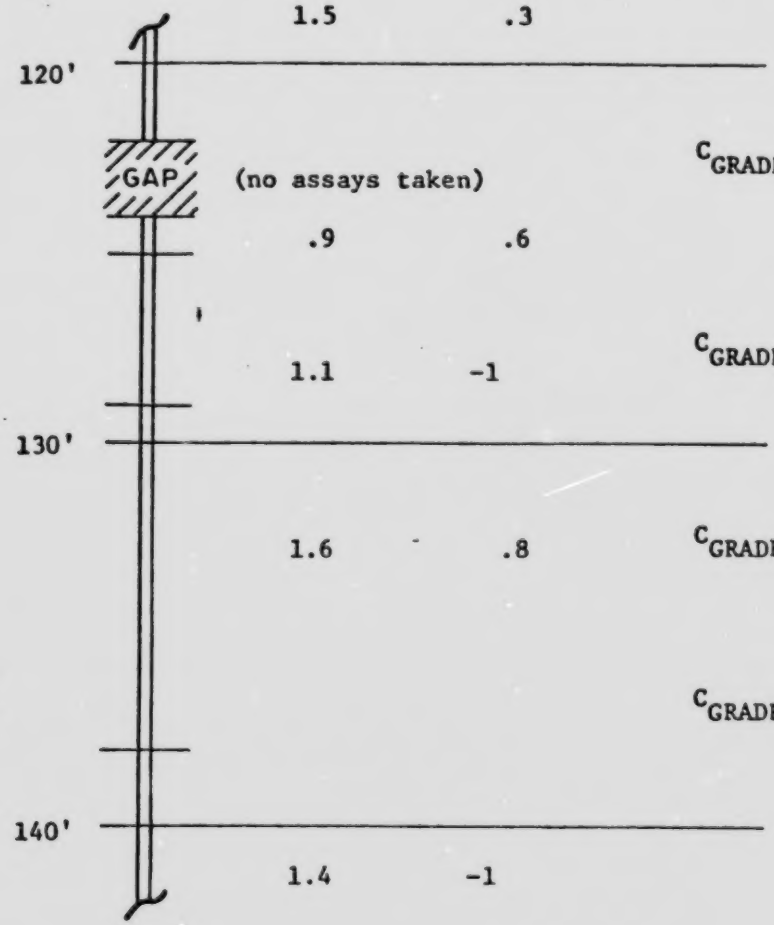
C is the value of the Composite

Ex: Suppose a hole with the following "collar-information":

X	Y	Z	AZ	DIP
100	100	450	0^o	0^o

and some "sample cards" as shown in Figure 4.

NOTE:
- Sample cards are in the format "From-To"
- Missing information on grades is: -1
- User has chosen COMP=10 feet.
- User has chosen TLMIN=0 feet.



$$C_{GRADE1} = \frac{(1.5\times2)+(.9\times1)+(1.1\times4)+(1.6\times1)}{(2+1+4+1)}$$

$$C_{GRADE2} = \frac{(.3\times2)+(.6\times1)+(.8\times1)}{(2+1+1)}$$

$$C_{GRADE1} = \frac{(1.6\times8)+(1.4\times2)}{(8+2)} = 1.56$$

$$C_{GRADE2} = \frac{(.8\times8)}{(8)} = .8$$

INPUT DATA

FROM	TO	GRADE1	GRADE2
→	122	1.5	.3
124	125	.9	.6
125	129	1.1	-1
129	138	1.6	.8
138	→	1.4	-1

OUTPUT DATA

X	Y	Z	C_{GRADE1}	C_{GRADE2}
100	100	325	1.23	.50
100	100	315	1.56	.80

FIGURE 4

THE COMPOSITING FUNCTION

It is also possible to use the density of the sample in the compositing function by fixing IDENS = 1. The function then becomes:

$$C = \frac{\sum g_i \cdot \ell_i \cdot d_i}{\sum \ell_i \cdot d_i}$$

Where: "di" is the density associated with Sample "i".

Ex: Suppose a hole with the following "collar-information":

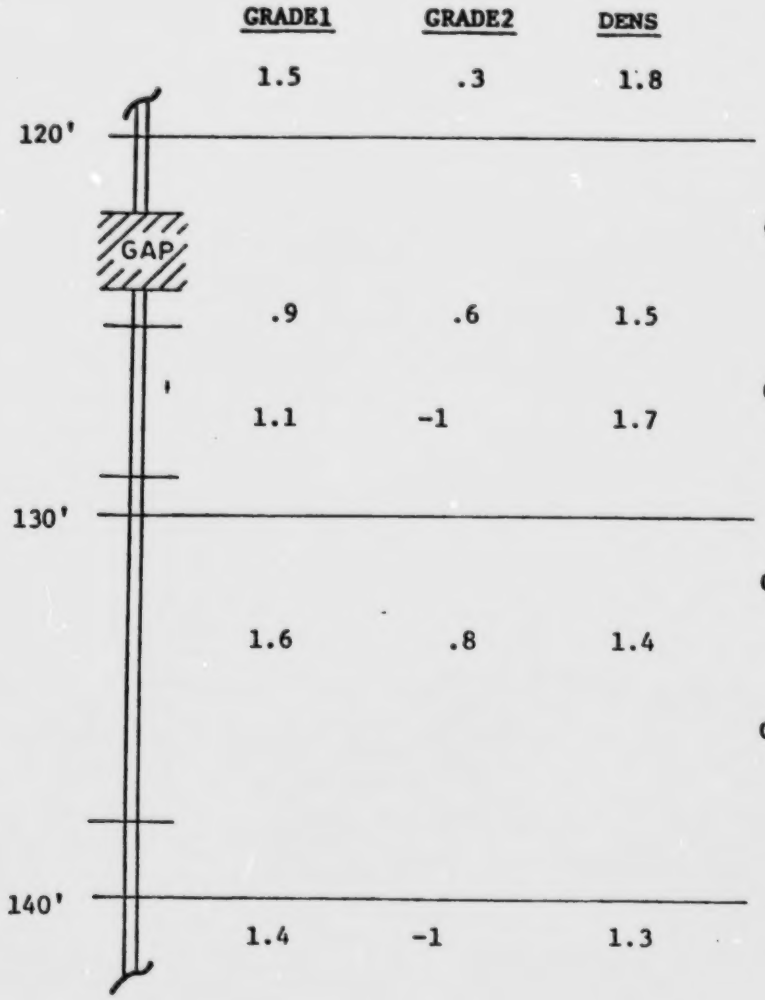
X	Y	Z	AZ	DIP
100	100	450	0°	0°

and some "sample cards" as shown in Figure 4-A.

NOTE:
- Sample cards are in the format "From-To)
- Missing information on grades is: -1
- User has chosen COMP=10 feet.
- User has chosen TLMIN=0 feet.

NOTE: It is imperative that all the densities be well defined in the input file:

- If the density is left blank for a given sample, then it is interpreted as zero-density. Thus the corresponding sample is not used.
- "Negative" density is interpreted as missing and the sample is not considered in the compositing.



$$C_{GRADE1} = \frac{(2\times1.5\times1.8)+(1\times.9\times1.5)+(4\times1.1\times1.7)+(1\times1.6\times1.4)}{(2\times1.8)+(1\times1.5)+(4\times1.7)+(1\times1.4)}$$

$$C_{GRADE2} = \frac{(2\times.3\times1.8)+(1\times.6\times1.5)+(1\times.8\times1.4)}{(2\times1.8)+(1\times1.5)+(1\times1.4)}$$

$$C_{GRADE1} = \frac{(8\times1.6\times1.4)+(2\times1.4\times1.3)}{(8\times1.4)+(2\times1.3)}$$

$$C_{GRADE2} = \frac{(8\times.8\times1.4)}{(8\times1.4)}$$

FROM	TO	GRADE1	GRADE2	DENS.
→	122	1.5	.3	1.8
124	125	.9	.6	1.5
125	129	1.1	-1	1.7
129	138	1.6	.8	1.4
138	→	1.4	-1	1.3

X	Y	Z	C_{GRADE1}	C_{GRADE2}
100	100	325	1.24	.48
100	100	315	1.56	.80

FIGURE 4-A

DILUTION FUNCTION

Whenever the dilution option is activated (IDILU=1) then the Compositing Function is modified in the following way:

The complete length of the composite (COMP/BENCH) is used as the reference denominator instead of the cumulated length of the portions of samples found for that composite. Thus, if there are "gaps" or missing values of samples for a composite will be less then if the dilution function was not activated.

This feature is advantageous in cases where gaps, as well as samples with missing labels, are interpreted as barren (hence 0.0)

Ex:

$$C = \frac{\sum g_i * l_i}{COMP}$$

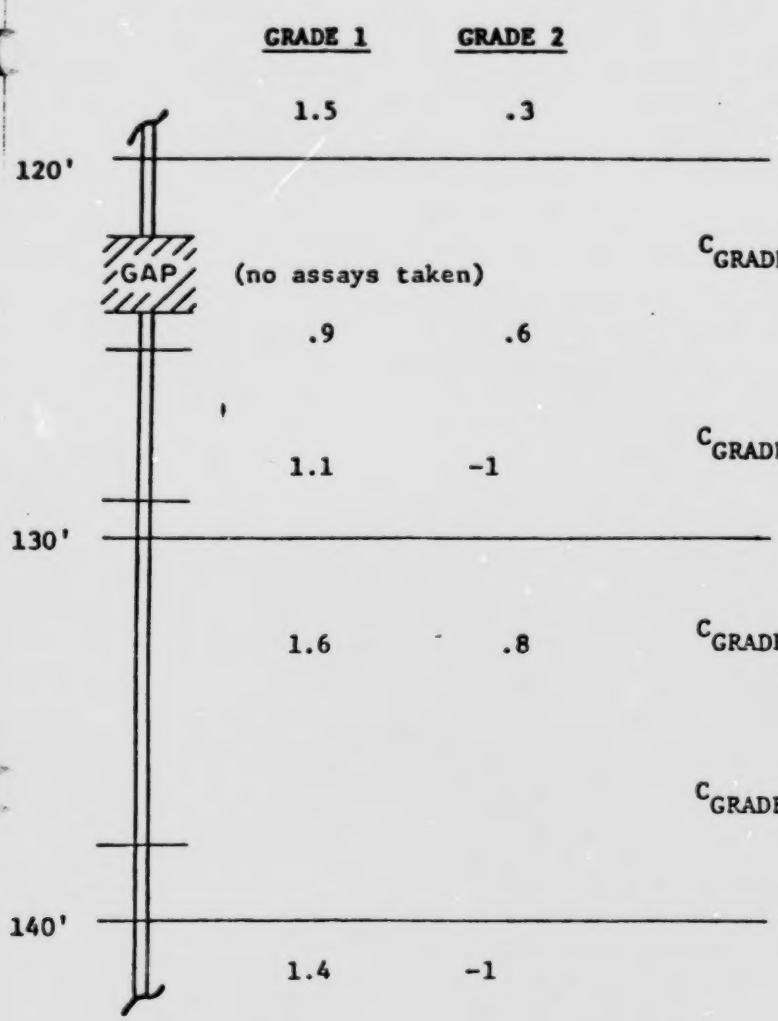
where : "g_i" is the grade associated with sample "i"

"l_i" is the length covered by sample "i"

COMP is the length of composite

It is stressed that in the Dilution case (IDILU=1) the "gap" and "TLMIN" notions are meaningless. The dilution option may be activated regardless of the value of ICUT option.

See Figure 5, how the values of the resulting composites are diluted when this option is activated; the input file is the same as in Figure 4.



$$C_{GRADE1} = \frac{(1.5\times2)+(.9\times1)+(1.1\times4)+(1.6\times1)}{10.0} = .99$$

$$C_{GRADE2} = \frac{(.3\times2)+(.6\times1)+(.8\times1)}{10.0} = .20$$

$$C_{GRADE1} = \frac{(1.6\times8)+(1.4\times2)}{10.0} = 1.56$$

$$C_{GRADE2} = \frac{(.8\times8)}{10.0} = .64$$

INPUT DATA

FROM	TO	GRADE1	GRADE2
→	122	1.5	.3
124	125	.9	.6
125	129	1.1	-1
129	138	1.6	.8
138	→	1.4	-1

OUTPUT DATA

X	Y	Z	C_{GRADE1}	C_{GRADE2}
100	100	325	.99	.20
100	100	315	1.56	.64

FIGURE 5

PROGRAM INPUT

COMPOS uses two input files; one with control parameters and the other one with sample data. Both of these files may reside either on diskettes or a hard disk unit. **COMPOS** prompts the user for the names of these files when the program starts.

PROGRAM OUTPUT

COMPOS uses two output files: on FOR06.DAT (default name) it prints back all options as they were read ; the user should always check to ensure that they were indeed read correctly.
The input file may be echo-printed (IECHO=1) if desired while statistics on each hole are always printed. A detailed analysis of the compositing process is also printed when the IPRINT option is activated (=1 or 2).

A composite file (whose name is defined by the user when prompted by the program) that contains all the composites that were created. This file will contain the following information depending on the compositing process selected:

a) FROM COLLAR (ICUT=1)
IHOLID,X,Y,Z,grades for the "NVAR" variables

b) BY BENCH (ICUT=0)
IHOLID,LEVEL,X,Y,Z,grades for the "NVAR" variables.

The user must make sure that the format provided (FMT4) can accommodate all of the above information which is detailed as follows:

IHOLID: Identification of the hole in which the composite was created (always 8 characters: the format MUST BE 2A4).

X,Y,Z: Coordinates at the center of the composite in output units (meters or feet).

LEVEL: Bench (level) number corresponding to the position of the composite. This number is in reference with Level #1, which was defined by the user. It may be negative because the user has the choice of the direction of numbering.

GRADES: Value of the composite for each variable. There is a maximum of 6 grades or variables which can be treated simultaneously (see next section). A value of -1 for a composite grade means that either no information was present, or that the available core length for that composite was less than the minimum acceptable length (fixed by the user).

MEMORY REQUIREMENTS:

If the available memory should prove insufficient for a particular problem (as noted by the program) the user should reduce the number of variables for which composites are computed.

The new dimension should be equal or greater to the number given by the MEMORY MANAGEMENT message of the previous run.

With **"NVAR" variables and "NS"** the number of "Sample-Cards" in the largest hole of the input file is given by the following formula:

$$NS = \frac{(16383 - 10 * NVAR)}{(2 + IREC + IDENS + NVAR)}$$

CONTROL PARAMETERS DESCRIPTION

Here is a detailed summary of the parameters which control **COMPOS.** A thorough understanding of their functions is required for proper program operation.

ICUT: This parameter tells the program how compositing is to be done:
ICUT=1 : compositing is done along the hole
ICUT=0 : compositing is done in equally spaced benches.

ICONV: If ICONV=1 then all the output values will be transformed from English to metric units. When the user opts for metric conversion he must make sure that all input control parameters are expressed in metric units.

If ICONV=0, then all the output values are left in the same units as in the input file.

NVAR: This is the number of variables on which compositing will be done. The maximum acceptable value is 6.

IREC: If IREC=0, then no value for CORE RECOVERY is read and it is not used to screen out sample values.

If IREC=1, then a value for CORE RECOVERY MUST BE READ along with the other variables in the hole sample file. This value is checked against the RMIN parameter. If the CORE RECOVERY is found to be smaller than the minimum acceptable value (RMIN) the sample is not not used in the compositing process.

RMIN: Used only when IREC=1, RMIN sets a lower limit for sample CORE RECOVERY, below which samples are considered not representative and are thus rejected. RMIN must be expressed in the same units as those used to measure CORE RECOVERY in the input file. Remember that if the CORE RECOVERY factor is left blank for a particular sample, it is interpreted as being equal to 0 and thus the sample will be eliminated. If however, it is missing or has not been measured and is entered as -1 in the input file it will be considered to be 100% and the sample will then always be kept regardless of the value given to RMIN.

TLMIN: This is the minimum allowable length for a sample to be used in the compositing process. If a sample has a length smaller than TLMIN, it will not be used but rather be considered missing.

XMIN,XMAX:
YMIN,YMAX
ZMIN,ZMAX These coordinate limits are imposed on the COMPOSITES as they are produced, NOT on the samples or holes as they appear in the input file. Only the composites that are contained within this "box" are kept and written on the output file.

IDILU: Dilution option.

When activated (IDILU=1), the compositing function creates a "0.0 grade sample" whenever "gaps" or "missing" grades are recorded. When disactivated (DEFAULT value, IDILU=0) the compositing function works as described previously

IDENS: When IDENS=0, the compositing function is simply a length-weighting procedure.

When IDENS=1, the compositing function becomes a density-length weighing procedure (see compositing function).

IFMT: There are three input file formats which can be accepted when reading the sample card file. They are:

"FROM-TO":	IFMT=0
"FROM-LENGTH"	IFMT=1
"CENTER-LENGTH"	IFMT=2

"COLLAR-COMPOSITING" (associated Control Parameters)

COMP: Required length of the composites.

DIPMIN, DIPMAX: Screening bracket for the hole collar DIP-ANGLE. The hole is rejected if its collar dip falls outside this bracket.

"LEVEL OR BENCH-COMPOSITING" (associated Control Parameters)

BENCH: Height of a level or a bench. Distance from the top to the toe of the bench.

XOL, YOL, ZOL: Usually the user fixes along the Z-coordinate a point where "bench" or Level #1 will be situated. Then one defines a reference point which lies on the middle plane (center) of that bench (or level). The coordinates of that point are XOL, YOL, ZOL.

AZL,DIPL: If the user wishes to tilt the benches, then the direction of the steepest slope is specified. (This notation will be familiar to geologists: this is the plunge, and its 2 parameters refer to only 1 plane in space.) This direction is expresses in degrees, from North, clockwise for AZL, and in degrees, from horizontal, for DIPL. AZL must be within the range 0° , 360° and DIPL must be within the range -90° , $+90^{\circ}$.

IDIR: Level #1 is fixed by setting the values for XOL, YOL, ZOL. Now, if the user decides that the level numbering will increase upward with the Z-coordinate he fixes IDIR=1. Conversely, if one needs the level-numbering to increase against the Z-coordinate, IDIR must be set to 0.

If the levels are horizontal, then each composite of a particular bench have the same Z-coordinate.

Sometimes one may be faced with "Negative" level-number. This is normal since these numbers are fixed in relation to the position of Level #1 and the parameter IDIR which were set by the user.

MAXDIF: As said before "Level-Compositing" implies that the "Information-Basis" is not a constant value. As one can see in Figure 6, the two composites created for this particular level do not have the same "Informaiton-Basis".

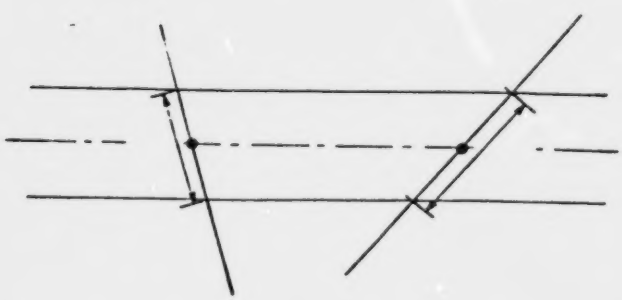


FIGURE 6

The control parameter MAXDIF gives the user a way to limt the variation of the "Information-Basis" within a certain range. The user decides the range within which the "Information-Basis" of the composites may vary by fixing MAXDIF according to the following formula:

$$\text{RANGE} = \left\{ \text{BENCH},\ \frac{\text{BENCH}*(1-\text{COS}(\text{MAXDIF}))}{\text{COS}(\text{MAXDIF})} \right\}$$

Ex:

MAXDIF	BENCH	INFORMATION-BASIS (RANGE)
25	10^{o}	$10^{o},11^{o}$
30	10^{o}	$10^{o},11.4^{o}$
45	10^{o}	$10^{o},14^{o}$
60	10^{o}	$10^{o},20^{o}$
75	10^{o}	$10^{o},29^{o}$

While reducing the variation range of the Information-Basis, the user is also limiting on the input data. Thus a good compromise must be determined based on user requirements and on the performance of the study.

CONTROL CARD DESCRIPTION

CARD	COLUMN	VAR.	FMT	DESCRIPTION
1	1-80	TITLE	20A4	Title card.
2	1	IECHO	I1	ECHO-PRINTING OPTION. =0 the samples in the input file are not printed back (default value). =1 input samples are all printed back as they are read.
	2	IPRINT	I1	PRINTED OUTPUT CONTROL OPTION. =0 minimum information on holes read and work done, is printed. =1 all rejected composites are printed back. =2 all accepted and rejected composites (except the ones for which there were no information "missing") are printed back.
2	3	IDEBUG	I1	Not used in current version
2	4	ICUT	I1	COMPOSITING PROCESS SELECTOR OPTION. =0 compositing will be done with reference to benches or levels. =1 compositing will be made with reference to the collar of each hole. =2 no compositing done - composites are the original samples.
2	5	IDIR	I1	LEVEL NUMBERING OPTION. =0 increasing level number going DOWN the Z-coordinate. =1 increasing level number going UP the Z-coordinate. (USED ONLY IF ICUT=0, DISREGARDED OTHERWISE)
2	6	ICONV	I1	OUTPUT UNITS CONVERSION OPTION. =0 no conversion of units is performed. =1 input file data units (coordinate) are converted from imperial to metric and output composite values are produced in metric.

NOTE: When ICONV=1, the user must make sure that all the "input-parameters" are given in metric units.(i.e. RMIN,XOL,YOL, ZOL,... etc)

2	7	IFMT	I1	SAMPLE FILE FORMAT OPTION. =0 the samples in the input file are in the form: "FROM-TO". =1 the samples in the input file are in the form: "FROM-LENGTH". =2 the samples in the input file are in the form: "CENTER-LENGTH".
2	8	IDILU*	I1	DILUTION OPTION =0 (default value) no dilution =1 dilution is performed (DISREGUARDED IF ICUT=2)
2	9	ISYS	I1	INPUT FILE TYPE: =0 (default) the drill hole file follows the GSII standards =1 the drill hole file is user defined.
2	10	IDIP	I1	Not used in the current version.
2	11	ISEAM	I1	Not used in the current version.
3	1-2	IDI1	I2	Not used in this version.
3	3-4	IDO1	I2	Not used in this version.

*NOTE: When IDILU = 1 One must remember that whatever the value of "IREC", "RMIN" and "TLMIN" (set by the user), the program disregards completely their respective function.

4	1	IDENS	I1	DENSITY COMPOSITING OPTION. =0 density is not considered in the compositing function (No value will be read for density in the sample file.) =1 density will be used as a factor in the compositing process. (A value of sample density must appear with every sample read.)
4	2	IREC	I1	CORE RECOVERY SELECTION OPTION. =0 composites are created without any reference to core recovery. =1 composites are created with reference to a minimum core recovery: "RMIN".
4	3-4	NVAR	I2	NUMBER OF VARIABLES TO BE PROCESSED (Max=20) in each sample.
4	5-14	RMIN	F10.0	MINIMUM CORE RECOVERY REQUIRED TO accept a sample. (Ignored if IREC=0) (Disregarded otherwise)

5	1-10	XOL	F10.0	X-COORDINATE of a point "A" on the center plane of Level #1. (USED ONLY IF ICUT=0)
5	12-20	YOL	F10.0	Y-COORDINATE of the same point "A" as described above. (USED ONLY IF ICUT=0)
5	21-30	ZOL	F10.0	Z-COORDINATE of the same point "A" as described above. (USED ONLY IF ICUT=0)
5	31-40	AZL	F10.0	AZIMUT-ANGLE (in degrees, from North clockwise) of level's steepest slope. (Must be within 0^{o} and 360^{o}).(USED ONLY IF ICUT=0)
5	41-50	DIPL	F10.0	DIP.ANGLE (in degrees,from horizontale of level's steepest slope. (must be within $(-90^{o},90^{o})$) (used only if ICUT=0)

*NOTE: If ICUT=1 or 2, then card 4 may be left blank but may not be ommitted!

6	1-10	COMP	F10.0	LENGTH OF COMPOSITES to be created. (Used ONLY if ICUT=1) (Disregarded otherwise)
6	11-20	BENCH	F10.0	HEIGHT OF LEVEL to be considered in compositing. (Used ONLY if ICUT=0) (Disregarded otherwise)
6	21-30	TLMIN	F10.0	MINIMUM LENGHT OF CORE necessary to form a composite. If TLMIN=0, any core length >0 will create a composite. (Used ONLY when IDILU=0) (Disregarded otherwise)

7	1-10	DIPMIN	F10.0	User defined DIP-ANGLE, range MINIMUM VALUES (must be within -90^{o},$+90^{o}$). (IF ICUT=1 OR 2 ONLY)
7	11-20	DIPMAX	F10.0	User defined DIP-ANGLE, range MAXIMUM VALUE (must be within -90^{o},$+90^{o}$). (IF ICUT=1 OR 2 ONLY)
7	21-30	MAXDIF	F10.0	MAXIMUM ANGLE DIFFERENCE between vertical to level and hole angle relative to level. (Must be within 0^{o}, 80^{o})* (IF ICUT=0 ONLY)

*NOTE: Care must be taken when choosing MAXDIF. Composites will not have the same information length basis. How to evaluate and thus control tha range is described in the first section of this guide.

8	1-10	XMIN	F10.0	MINIMUM acceptable X-coordinate for keeping a composite in the output file.
8	11-20	XMAX	F10.0	MAXIMUM acceptable X-coordinate for keeping a composite in the output file.
8	21-30	YMIN	F10.0	MINIMUM acceptable Y-coordinate for keeping a composite in the output file.
8	31-40	YMAX	F10.0	MAXIMUM acceptable Y-coordinate for keeping a composite in the output file.
8	41-50	ZMIN	F10.0	MINIMUM acceptable Z-coordinate for keeping a composite in the output file.
8	51-60	ZMAX	F10.0	MAXIMUM acceptable Z-coordinate for keeping a composite in the output file.
9	1-4	INAME	A4	NAME of first VARIABLE to be treated (4 characters maximum).

*NOTE: The user should take great care to ensure that there are exactly "NVAR" cards of type 9 (one for each variable).

10	1-80	FMT1	20A4	FORMAT of CODE #1 CARD TYPE (collar card) should read: (ICODE,IHOLID,X,Y,Z,AZ,DIP)
11	1-80	FMT2	20A4	FORMAT of CODE #2 CARD TYPE (deviation cards) should read: (ICODE,IHOLID,Z,AZ,DIP)
12	1-80	FMT3	20A4	FORMAT of CODE #3 CARD TYPE. Should read: ICODE,IHOLID,FROM,TO,$GRADE_1$ $GRADE_2$,.....$GRADE_{NVAR}$' and DENS(IF DENS=1), and REC(IF IREC=1)).

*NOTE: Variable "ICOD" format must be "I1" (always read in column #1). Variable "IHOLID" format must be "2A4".

*NOTE: The FROM and TO variables are used if IMFT=0 while the (FROM,LENGTH) or (CENTER,LENGTH) variables are used if IFMT is set to 1 or 2 respectively.

13	1-80	FMT4	20A4	OUTPUT file format. This format supplied by the user must accommodate the following information in the following statement.

WRITE(IDV1,FMT4)IHOLID,NB,XC,YC,ZC,$GRADE_1$,....$GRADE_{nvar}$

where IHOLID must be written as 2A4

NB is the "integer" bench number (ICUT=0) or the sequence number of the composite in drill hole (ICUT= 1 or 2)

XC,YC,ZC are the coordinates of the center of the composite.

$GRADE_{1...nvar}$ are the grades of the NVAR variables.

TEST_RUN

PROGRAM_COMPOS

FIRST FEW LINES OF FILE "DHDAT1.DAT"
(used for test run)

1—6702	0	0	1820.0	180.0	-45.0
2—6702	150.0	180.0	-41.0		
2—6702	350.0	180.0	-40.0		
3—6702	46.0	56.0	0.19	0.06	
3—6702	56.0	66.0	0.15	0.05	
3—6702	66.0	76.0	0.25	0.13	
3—6702	76.0	86.0	0.22	0.09	
3—6702	86.0	96.0	0.21	0.07	
3—6702	96.0	106.0	0.16	0.04	
3—6702	106.0	116.0	0.22	0.08	
3—6702	116.0	126.0	0.22	0.19	
3—6702	126.0	136.0	0.21	0.12	
3—6702	136.0	146.0	0.30	0.25	
3—6702	146.0	156.0	0.27	0.20	
3—6702	156.0	166.0	0.28	0.88	
3—6702	166.0	176.0	0.24	0.24	
3—6702	176.0	186.0	0.35	0.34	
3—6702	186.0	196.0	0.34	0.39	
3—6702	196.0	206.0	0.36	0.34	
3—6702	206.0	216.0	0.24	0.27	
3—6702	216.0	226.0	0.25	0.25	
3—6702	226.0	236.0	0.30	0.22	
3—6702	236.0	246.0	0.35	0.36	
3—6702	246.0	256.0	0.43	0.36	
3—6702	256.0	266.0	0.46	0.40	
3—6702	266.0	276.0	0.46	0.38	
3—6702	276.0	286.0	0.50	0.36	
3—6702	286.0	296.0	0.55	0.38	
3—6702	296.0	306.0	0.43	0.35	
3—6702	306.0	316.0	0.38	0.48	
3—6702	316.0	322.0	0.55	0.54	
3—6702	322.0	326.0	0.41	0.56	
3—6702	326.0	336.0	0.21	0.12	
3—6702	336.0	346.0	0.17	0.07	
3—6702	346.0	356.0	0.19	0.06	
3—6702	356.0	462.0			
1—6704	0	-400.0	1840.0	0	-90.0
2—6704	120.0	45.0	-88.0		
2—6704	330.0	90.0	-85.0		
3—6704	185.5	195.5	0.95	0.80	
3—6704	195.5	200.3	3.05	0.83	
3—6704	200.3	202.0	0.28	0.46	
3—6704	202.0	204.5	3.20	1.47	
3—6704	204.5	208.0	0.71	1.65	
3—6704	208.0	210.0	4.76	1.56	
3—6704	210.0	218.0	0.89	2.38	
3—6704	218.0	225.0	0.65	0.71	
3—6704	225.0	235.0	0.61	0.73	

THE CONTROL FILE

Input control parameters for program execution:

```
   GEOSTAT WORK STATION --PROGRAM COMPOS
00001001000
0000
0002
   1000.00    -1000.0     1212.5        0.0        0.0
                 25.0
                              50.0
   -5000.0     5000.0    -5000.0     5000.0       10.0     2000.0
Ni
Cu
(I1,1X,2A4,5F10.0)
(I1,1X,2A4,3F10.0)
(I1,1X,2A4,4F10.0)
(1X,2A4,1X,I5,3F10.1,2F10.3)
```

LINE	COMMENT
1	Title Card.
2	No Echo printing; Benchlike compositing with level number increasing upward; dilution option.
3	Dummy card.
4	Simple compositing of two variable.
5	Middle plane of Bench (level) #1 localisation
6	25 feet long composites (heigth of a Bench).
7	No holes with more then 50^{o} from normal to Bench will be kept.
8	3D - Limiting box for accepting or rejecting a composite.
9-10	Variables are Ni and Cu.
11-13	Input formats for Standard GSII input file.
14	Output format (Hole-ID, Bench #, X, Y, Z, Values of the 2 composites, Ni and Cu).

TEST RUN

Print out of program compos (file FOR06.DAT)

```
**********************************************************
**** G E O S T A T I S T I C A L    P A C K A G E ****
****      PROGRAM     COMPOS    VERSION   V2.0       ****
**** COPYRIGHT GEOSTAT SYSTEMS INTERNATIONAL 1983 ****
**********************************************************

 GEOSTAT WORK STATION -- PROGRAM COMPOS

OPTION PARAMETERS
IECHO  = 0 +++ IPRINT = 0 +++ IDEBUG = 0
ICUT   = 0 +++ IDIR   = 1 +++ ICONV  = 0
IFMT   = 0 +++ IDILU  = 1 +++ ISYS   = 0
IDIP   = 0 +++ ISEAM  = 0


LOGICAL INPUT-OUTPUT DEVICE NUMBERS
IDI1 =    10
IDO1 =   - 20


CONTROL PARAMETERS
IDENS  = 0 +++ IREC   = 0 +++ NVAR   = 2


COORDINATES OF A POINT LYING IN
THE MIDDLE PLANE OF LEVEL #1 :
      XOL           YOL           ZOL
   1000.00      -1000.00       1212.50

AZL  =         .00
DIPL =         .00


COMPOSITE CARACTERISTICS

COMPOSITE LENGTH (BENCH) =                25.00

MINIMUM SAMPLE LENGTH TO CREATE
AN ACCEPTABLE COMPOSITE (TLMIN) =          .00



***********
* WARNING *
***********

  1 -  BECAUSE IDILU IS SET TO 1 (ONE),
       THERE WILL BE NO COMPOSITE REJECTION
       EVEN IF SAMPLE LENGTH FOR THAT COM-
       POSITE IS LOWER THEN  'TLMIN' .


USER DEFINED MAXIMUM ANGLE DIFFERENCE
BETWEEN NORMAL TO BENCH AND
HOLE-ANGLE RELATIVE TO BENCH

DIPDIF=      50.00
```

OUTPUT POSITION LIMITS

XMIN	XMAX	YMIN	YMAX	ZMIN	ZMAX
-5000.00	5000.00	-5000.00	5000.00	10.00	2000.00

VARIABLE(S) CARACTERISTICS

NUMBER OF VARIABLES (NVAR) = 2

NAME(S) : Ni Cu

CARD NO: 1 INPUT FORMAT (FMT1) : (i1,1x,2a4,5f10.0)

CARD NO: 2 INPUT FORMAT (FMT2) : (i1,1x,2a4,3f10.0)

CARD NO: 3 INPUT FORMAT (FMT3) : (i1,1x,2a4,4f10.0)

CARD NO: 4 OUTPUT FORMAT (FMT4) : (1x,2a4,1x,i5,3f10.1,2f10.3)

LEGEND
======

TLEN : HOLE LENGTH FROM COLLAR TO LAST SAMPLE.
NCA : # OF COMPOSITES ACCEPTED.
MIN : # OF COMPOSITES REJECTED BECAUSE < TLMIN.
POS : # OF COMPOSITES REJECTED BECAUSE OFF LIMITS
NS : # OF SAMPLES WITH AT LEAST ONE GRADE >= 0.
REC : # OF SAMPLES REJECTED BECAUSE REC(S) < RMIN
TLENS : CUMULATED SAMPLE LENGTH ALONG THE HOLE.
SLM : MEAN SAMPLE LENGTH.

HOLE-ID	TLEN	NCA	MIN	POS	NS	REC	TLENS	SLM	Ni	Cu
-6702	462.0	13	0	0	33	0	416.0	12.606	.226	.194
-6704	340.0	14	0	0	20	0	154.5	7.725	.879	.899
-6706	101.0	5	0	0	4	0	45.0	11.250	.359	.119
-6707	322.0	13	0	0	19	0	225.0	11.842	.482	.444
-6708	343.0	14	0	0	19	0	185.0	9.737	.797	1.051
-6801	312.0	14	0	0	3	0	48.0	16.000	.229	.283
HOLE-ID -6802 HAS NO DEVIATION CARD.										
-6802	336.0	14	0	0	2	0	31.0	15.500	.121	.145
HOLE-ID -6803 HAS NO DEVIATION CARD.										
-6803	413.0	17	0	0	3	0	145.0	48.333	.043	.048
-6807	203.0	9	0	0	11	0	135.0	12.273	.361	.320
-6808	375.0	16	0	0	26	0	267.0	10.269	.527	.679
-6809	287.0	13	0	0	14	0	146.0	10.429	.326	.377
-6811	328.0	14	0	0	16	0	191.0	11.938	.435	.557
-6812	205.0	9	0	0	15	0	188.0	12.533	.381	.517
-6813	300.0	12	0	0	18	0	189.5	10.528	.391	.371
-6814	294.0	12	0	0	16	0	165.0	10.313	.668	.636
-6815	320.0	13	0	0	20	0	228.0	11.400	.317	.403
-6817	365.0	15	0	0	2	0	300.0	150.000	.044	.044
-6818	286.0	12	0	0	9	0	156.0	17.333	.230	.189
-6819	324.0	14	0	0	22	0	250.0	11.364	.299	.236
-6820	302.0	13	0	0	18	0	229.0	12.722	.230	.217
-6821	269.0	12	0	0	4	0	46.5	11.625	.254	.292
-6822	249.0	11	0	0	11	0	146.0	13.273	.237	.243
HOLE-ID -6823 HAS NO DEVIATION CARD.										
-6823	315.0	13	0	0	13	0	160.5	12.346	.398	.298
-6824	318.0	14	0	0	16	0	217.0	13.563	.230	.238

HOLE-ID -6825 HAS NO DEVIATION CARD.

-6825	177.0	8	0	0	2	0	28.5	14.250	.204	.337
-6826	225.0	10	0	0	15	0	181.0	12.067	.339	.366
-6827	317.0	13	0	0	18	0	225.5	12.528	.483	.561
-6828	320.0	14	0	0	18	0	193.8	10.767	.694	.752
-6829	329.0	14	0	0	25	0	239.0	9.560	.722	.892
-6830	331.0	14	0	0	21	0	251.0	11.952	.580	.599
-6831	311.0	14	0	0	17	0	191.0	11.235	.355	.594
-6832	352.0	15	0	0	15	0	201.0	13.400	.167	.391

HOLE-ID -6833 HAS NO DEVIATION CARD.

-6833	177.0	8	0	0	6	0	142.3	23.717	.186	.143
-6834	395.0	17	0	0	18	0	195.0	10.833	.457	.390
-6835	421.0	17	0	0	19	0	221.0	11.632	.367	.332
-6901	305.0	13	0	0	18	0	163.0	9.056	.331	.434
-6906	330.0	14	0	0	6	0	55.3	9.217	.221	.299
-6907	225.0	10	0	0	7	0	61.0	8.714	.231	.460
-6908	280.0	12	0	0	14	0	124.5	8.893	.406	.549
-6920	450.0	19	0	0	15	0	155.0	10.333	.291	.473
-6922	530.0	22	0	0	42	0	387.0	9.214	.309	.329
-6923	130.0	6	0	0	8	0	60.0	7.500	.288	.251
-6926	240.0	8	0	0	7	0	79.0	11.286	.275	.330

1

OVERALL SUMMARY
==========

TOTAL NUMBER OF HOLES SUBMITTED : 43

NUMBER OF HOLES WITH COMPOSITES : 43

TOTAL NUMBER OF SAMPLES : 625

TOTAL NUMBER OF SAMPLES REJECTED (LOW-REC) : 0

MEAN SAMPLE LENGTH : 11.87

TOTAL NUMBER OF COMPOSITE : 554

TOTAL NUMBER OF VALID COMPOSITE : 554

TOTAL NUMBER OF COMPOSITE REJECTED BECAUSE

SAMPLE LENGTH < : .00 0
OFF LIMITS : 0

	N1	Cu
TOTAL NUMBER OF COMPOSITES ACCEPTED	554	554
TOTAL NUMBER OF COMPOSITES REJECTED	0	0

MEMORY AVAILABLE :16383
MEMORY USED : 174
MAXIMUM # OF SAMPLE/HOLE : 4089

+++ NORMAL END OF PROGRAM +++

FIRST FEW LINES OF RESULTS (file COMP3D.DAT)

HOLID	BENCH	X	Y	Z	Ni	Cu
-6702	25	.0	-17.5	1812.5	.000	.000
-6702	24	.0	-42.5	1787.5	.086	.028
-6702	23	.0	-67.5	1762.5	.216	.089
-6702	22	.0	-92.5	1737.5	.206	.113
-6702	21	.0	-119.4	1712.5	.273	.395
-6702	20	.0	-148.1	1687.5	.327	.335
-6702	19	.0	-176.9	1662.5	.301	.282
-6702	18	.0	-205.7	1637.5	.467	.376
-6702	17	.0	-234.4	1612.5	.463	.437
-6702	16	.0	-263.2	1587.5	.162	.082
-6702	15	.0	-292.5	1562.5	.000	.000
-6702	14	.0	-322.2	1537.5	.000	.000
-6702	13	.0	-352.0	1512.5	.000	.000
-6704	26	.0	-400.0	1837.5	.000	.000
-6704	25	.0	-400.0	1812.5	.000	.000
-6704	24	.0	-400.0	1787.5	.000	.000
-6704	23	.0	-400.0	1762.5	.000	.000
-6704	22	.0	-400.0	1737.5	.000	.000
-6704	21	.3	-399.7	1712.5	.000	.000
-6704	20	.9	-399.1	1687.5	.000	.000
-6704	19	1.5	-398.5	1662.5	.173	.145
-6704	18	2.2	-397.8	1637.5	1.791	1.349
-6704	17	2.8	-397.2	1612.5	.658	.904
-6704	16	3.4	-396.6	1587.5	.625	.704
-6704	15	4.0	-396.0	1562.5	.930	1.339
-6704	14	4.6	-395.4	1537.5	1.253	1.111
-6704	13	5.2	-394.8	1512.5	.000	.000
-6706	26	400.0	.0	1837.5	.000	.000
-6706	25	400.0	.0	1812.5	.000	.000
-6706	24	400.0	.0	1787.5	.000	.000
-6706	23	400.0	.0	1762.5	.645	.214
-6706	22	400.0	.0	1737.5	.000	.000
-6707	26	400.0	-400.0	1837.5	.000	.000
-6707	25	400.0	-400.0	1812.5	.000	.000
-6707	24	400.0	-400.0	1787.5	.000	.000
-6707	23	400.0	-400.0	1762.5	.404	.404
-6707	22	400.0	-399.3	1737.5	.436	.336
-6707	21	400.0	-398.0	1712.5	.405	.326
-6707	20	400.0	-396.7	1687.5	.852	.566
-6707	19	400.0	-395.4	1662.5	.960	.734
-6707	18	398.9	-394.0	1637.5	.812	.866

GEOSTAT SYSTEMS INTERNATIONAL INC.

H I S T O

A PROGRAM TO COMPUTE STATISTICS
AND PRINT RELATIVE AND CUMULATIVE HISTOGRAMS
OF MULTIVARIATE DATA.

USER'S GUIDE

VERSION 2.3

IBM-PC DOS V1.1 or V2.0

Gilbert Sergerie
Montreal, November 1981
Revised, December 1983

HISTO INSTALLATION GUIDE

Now that you have received our diskette with the **HISTO** program, please read these few instructions before using it:

HISTO ORGANIZATION

HISTO is made of the following files:

HISTO.BAT: small command file which controls the editing of controls and execution of program

MHISTO.EXE: program to control the editing of controls with full screen menus

GEOSTAT.EXE: application program itself. It reads the control and input data file(s) and produces all the output files including those for the printer and the plotter

HARDWARE SPECIFICATIONS

HISTO runs on IBM PC, XT, AT or compatibles with DOS (Disk Operating System) version 2.0 and following. A minimum of 256K of machine resident memory is necessary. We may accommodate a smaller memory size. Please contact your GSII representative.

HISTO also needs a numerical coprocessor (8087 or 80287) on the board to run successfully. A special version for machines without that chip can be prepared on request.

HISTO can run on machines with only one floppy disk drive. A second floppy drive or an hard disk are recommended however.

INSTALLATION OF HISTO ON A HARD DISK

The **HISTO** program that you received has been designed to run from the original diskette without any particular installation procedure. However, if you have a hard disk, you can install some of the program modules on it and run them from there without having to manipulate diskettes. In order to do that we suggest the following procedure:

+ on your hard disk, create a directory with the name GSIPROG. Make sure that the hard disk is the default drive (the prompt should start with C>). Then enter the DOS command:

MD GSIPROG

+ next, you go to this directory with the DOS command:

CD GSIPROG

(Note: if you have specified PROMPT PQ$G before or if you have this command in your AUTOEXEC file, the prompt on your screen should now be: C:\GSIPROG=>

+ take your write-protected diskette of **HISTO** and place it in drive A

+ copy the command file of **HISTO** from the diskette to the hard disk with the DOS command:

COPY A:HISTO.BAT

+ copy the control editing module of **HISTO** from the diskette to the hard disk with the DOS command:

COPY A:MHISTO.EXE

+ copy the application program itself from the diskette to the hard disk. Now, we will change its name on the hard disk to avoid any confusion with other GSII programs that you may want to install in the same way. The DOS command to use is:

COPY A:GEOSTAT.EXE CHISTO.EXE

Once this operation is completed you should have on the GSIPROG directory of your hard disk the following files (you can check it with a DIR command): HISTO.BAT, MHISTO.EXE, CHISTO.EXE. You can now remove the diskette from the drive and store it in a safe place since you no longer need it.

The last operation is the editing of the HISTO.BAT file to reflect the new organization of your program. You can use any editor that you are used to on your machine or the EDLIN editor of DOS. Changes are:

line 3: change "**A:MHISTO**" into "**MHISTO**"

line 6: change "**A:GEOSTAT**" into "**CHISTO**"

Note: if you wish to be able to run **HISTO** from any directory of your hard disk, we suggest that you include the following DOS command in your AUTOEXEC file: **PATH = C:\GSIPROG**

RUNNING THE DEMO CASE

HISTO is supplied with data files to let you reproduce a demo case that is described in the last section ofthis manual. There is a control file **HISTO.CTL** and data file**COMP3D.DAT.** The procedure to run the demo depends of the installation of the program.

+ Running the demo case from the original diskette

Take the original diskette, remove the write protection tab and insert the diskette in drive A. You can "boot" directly on the diskette if your machine is off (in that case, make sure that drive **A** is closed and simply turn the machine on) or you enter: **A:HISTO.**

On your screen, you get a banner with the program name and version number. Press any key and you get a "Main Menu" on the screen. At that point you may want to look at the controls for the demo case in file **HISTO.CTL** using option 2 (see section on control menus below). If you have a color monitor, you may also try option 5. However, to runthe demo case, you need use option 1 (for **EXECUTE**). At that point the menu disappears from the screen and after a while another banner with program name and version number shows up. It is immediately followed by the following prompt:

ENTER PRINTER OUTPUT FILE: [FORO6.DAT]

For this demo case, we suggest that you enter **USER** in order to see the printout of the execution of the program on the screen. Then you see the banner a second time and the next prompt is:

ENTER CTRL PARAMETER FILE

Enter: **A:HISTO.CTL**

Next prompt is:

ENTER MAIN DATA FILE

Enter: **A:COMP3D.DAT**

At that point, you start seeing the printout of the execution on the screen. If it goes too fast, you can stop it by pressing the **<CTRL>** and **<S>** keys at the same time. Press the same two keys to resume execution. When everything is finished the message **"Stop - Program terminated"** appears on the screen and soon you are back to the original welcome banner. Press any key to get to the main menu again. Then select option 4 to get back to the DOS operating system. Remove the diskette from the drive and put write protection tab back on it.

Note: If you do not want to write on your original diskette, printer or any output files can be stored on a diskette in a second floppy drive or your hard disk (e.g. **B:HISTO.PRT** or **C:HISTO.PRT** instead of USER for the printer output file.

+ Running the democase from the hard disk

We assume that you have installed the programs on the directory **GSIPROG** of your hard disk as explained before. The default drive is the hard disk (prompt C>). If you do not have a path to **GSIPROG** in your AUTOEXEC procedure, you need get to that directory before you start the procedure with the DOS command:

CD GSIPROG

In both cases, you start by entering: **HISTO**

On your screen, you get a banner with the program name and version number. Press any key and you get a "Main Menu" on the screen. At that point you may want to look at the controls for the demo case in file **HISTO.CTL** using option 2 (see section on control menus below). If you have a color monitor, you may also try option 5. However, to run the demo case, you need use option 1 (for EXECUTE). Before you do that, make sure that you have the original diskette in drive A. You do not have to remove the write protection tab however. Menu disappears from the screen and after a while another banner with program name and version number shows up. It is immediately followed by the prompt:

ENTER PRINTER OUTPUT FILE: [FORO6.DAT]

For this demo case, we suggest that you enter **USER** in order to see the printout of the execution of the program on the screen. Then you see the banner a second time and the next prompt is:

ENTER CTRL PARAMETER FILE:

Enter: **A:HISTO.CTL**

Next prompt is:

ENTER MAIN DATA FILE:

Enter: **A:COMP3D.DAT**

At that point, you start seeing the printout of the execution on the screen. If it goes too fast, you can stop it by pressing the **<CTRL>** and **<S>** keys at the same time. Press the same two keys to resume execution. When everything is finished the message **"Stop - Program terminated"** appears on the screen and soon you are back to the original welcome banner. Press any key to get to the main menu again. Then select option 4to get back to the DOS operating system.

RUNNING YOUR OWN CASE

The procedure is the same as for the demo case except that you need supply your own control and input data files. You can use options 2 and 3 of the main menu to generate your own control files (see below). Input data file can be on diskette or hard disk. Make sure that you always use the right device identifier when you answer the prompts (e.g. **B:MYFILE.DAT** if input data is on drive B).

EDITING CONTROLS THROUGH MENU PROCEDURE

Controls for the execution of the **HISTO** program are set in a small input file called the control parameter file (**HISTO.CTL** for the democase). A full description of the parameters in this file is given in the section "Control Card Description" of this manual. Based on this description, you can use a text editor on your machine (like EDLIN of DOS) to set the controls in that file. The alternative is to use the menu facility supplied with the program. To do that, you just select option 2 (**"Edit a previous control file"**) or 3 (**"Create a new control file"**) of the program main menu. In the first case you are prompted for the name of the control file to edit. Then you get to the first page of the control editing menu. You will notice the cursor in the first field to be filled. Fill the field as required: hitting the **<RETURN>** key will bring the cursor to the next field, and so on.

If you wish to go down or up through a menu page without changing any parameter, use key arrow down and arrow up respectively.

At the bottom of the screen you see a choice of options in reverse video:

Escape, to return to the main menu

Page down, to get to the next page of the menu (for last page, to get back to page one)

Page up, to get back to the previous page (for page one, to get to the last page of the menu)

Replace or **Insert** mode, to know whether you are in insert or replace mode

Note that all the keys are active, for instance if after field 10 you realize that you made a mistake in field 5, you can get back there with the arrow keys.

The second page will appear automatically after the **<RETURN>** you entered after filling the last field of the first page.

If, when in the second page, you want to go back to page one,

press <**PAGE UP**>. When you have finished entering all your values, press <**ESCcape**> key. You will then have to name the control file you have just created or edited. Make sure you do not choose a name already in existence unless you want to erase the old version of the control file. If you just edited an existing control file the name of this file is the default of the prompt.

If you do not want to keep the controls at all, press the <**ESCcape**> key a second time.

Once you have entered the name of the new control file and pressed the <**RETURN**> key, you are back to the main menu.

DESCRIPTION

1 INTRODUCTION

Program **HISTO** is an efficient FORTRAN 77 Program for representation of sample population histograms and statistics calculations. The program can handle any sample size and offers a number of options which enable the user to specify his own requirements.

Amongst available options are:

- Echo printing of input data
- Data processing in log-transformed equivalent.
- Data selection with respect to:

  (a) missing value indicator
  (b) outliers
  (c) constraints on other variables.

- Processing of up to 25 variables in a single run.

The printing of both relative and cumulative histograms is a standard feature of the program.

STATISTICAL CONSIDERATIONS

The statistical parameters of the sample population under study are calculated using the formulae available. they may be summarized as:

A) ARITHMETIC MEAN: $\bar{M}$

$$\bar{M} = \frac{\sum_{i=1}^{n} X_i}{n}$$

where X_i = measured value of sample i

n = number of values

B) VARIANCE: S^2

$$S^2 = \frac{\sum_{i=1}^{n} (X_i - \bar{M})^2}{n - 1}$$

The STANDARD DEVIATION S is the square root of the VARIANCE

3 DESCRIPTION OF CONTROL OPTIONS

Several electives may be used to fully control the distribution study to be executed, without any modifications to the existing data file:

3.1 Echo Option on Printout

A printout of the data file, as read by the user defined format is produced. Option name is IECHO.

3.2 Logarithmic Option

This option, when activated, specifies that in addition to the above defined calculations on real observed values, the statistics on ln-transformed data are calculated and all histograms will be shown with a logarithmic scale on the horizontal axis.

Note that the transformations of mean and standard deviation of ln-transformed data using

$$m = e^{g+b^2/2}$$

where g = mean of ln-transformed values

b^2 = variance of ln-transformed values.

$$s^2 = m^2 (e^{b^2} - 1)$$

equation is NOT done by the program.

3.3 Validating the data

There are 3 ways the user may control which data are to be used for the program execution:

- Missing value indicator: (IMISS option) - this option enables the deletion of samples for which no information is available. This may be indicated by a fixed number (v.g. - 1.00).

- Lower and upper limits on the variable under study.Restrictions may be specified by the user which will enable the program to disregard values outside a given permissible range: Note that the program includes values equal to the limits themselves.

- Restriction on other variables: when desired the user may discard those samples for which constraints other than on the variable under study are to be applied. Examples of such constraints may be location (X,Y,Z) or other measured variables. (Option NBREST). A total of 5 restricting variables may be specified this way.

3.4 Scale of Diagrams

You can control the scale on both vertical and horizontal axes.

- Vertical axis (for relative histogram only. On the cumulative histogram the scale goes automatically from 0 to 100%). You can select the lower and upper limits of percent values on that axis (respectively PINF and PSUP) or leave this determination to the program.

- Horizontal axis (same for both diagrams). Here again, you can select the lower and upper limits (BINF adn BSUP) on that axis or leave it to the program.

4 INPUT/OUTPUT FEATURES

4.1 INPUT

HISTO reads two input files : one with control parameters and the other one with sample data. These files resides either on diskettes or on a hard disk unit. **HISTO** prompts the user for the names of the files when the program starts.

Each sample must contain the NBREST restriction variables (if NBREST is not 0) and the NBVAR variables to be analysed.

4.2 PROGRAM OUTPUT

HISTO uses one output file. It's default name is FOR06.DAT.

5 PROGRAM REQUIREMENTS

Printer for output(*).

(*) If the user has no printer, then he may redirect the output to the console by answering CON when prompted for the output file name

CONTROL CARD DESCRIPTION

CARD	COLUMN	VARIABLE	FORMAT	DESCRIPTION
1	1-80	TITLE	20A4	Title card.
2	1	IECHO	I1	Echo printing option. =0 The input samples are not printed back as they are read (default value). =1 Only the samples that fall inside the limited area are printed. =2 All samples are printed back. The samples that are deleted on the basis of tests against user specified limits are flagged as such.
2	2	IPRINT	I1	Not used in this version.
2	3	IDEBUG	I1	Not used in this version.
2	4-5	NBREST	I2	Number of restriction variables. These variables are read and tested against user defined limits (see card 3) but are NOT used in the computation of statistics. A coordinate (X, Y or Z) could be such a variable. NBREST can be set to zero (0) if no such variables are used and should not exceed 5.
2	6-7	NBVAR	I2	Number of variables on which the statistics will be computed. NBVAR should be between 1 and 25.
2	8-9	DUMMY	I2	This parameter is not used in the IBM-PC version.
3	1-10	RESINF(I)	F10.0	Minimum allowable value for restriction variable I.
3	11-20	RESSUP(I)	F10.0	Maximum allowable value for restriction variable I

NOTE: If no restriction variables are read (NBREST=0), then card 3 MUST BE OMITTED.

If restriction variables are read (NBREST > = 1), then the user must make sure that there are exactly NBREST cards of type 3.

4	1-80	STITLE	20A4	Variable name and subtitle.
5	1	ILOG	I1	Logarithmic transformation option. =0 The statistics will be computed on the variable itself. =1 The statistics will be computed on the natural logarithm of the variable.
5	2	IMISS	I1	Missing value option. =0 All the variable values read are assumed to be valid and no samples may have missing values for this variable. =1 Some samples may not contain a valid value for this variable. These missing analyses are indicated in the file by the constant value, given to variable ABSENT.
5	3-5	LENPA	I3	Width (in characters) of the histograms and cumulative frequency curves that will be printed. This number must be between 20 and 125. If the output file is redirected to the screen and LENPA is greater than the screen width then the drawings will be folded.
5	6-15	ABSENT	F10.0	Missing value indicator. If option IMISS is set to 1, then the value given to ABSENT will be taken as indicative of a missing analysis. Any sample with such a value will not be used for the computation of the statistics of the current variable. Leave blank if IMISS is set to 0.
6	1-10	DINF	F10.0	Lowest allowable value for the variable.
6	11-20	DSUP	F10.0	Largest allowable value for the variable.

NOTE: If BOTH parameters DINF and DSUP are set to 0.0, then no limits will be imposed on the variable and all values will be used (except for the missing samples, if any, which will always be filtered out).

7	1-10	BINF	F10.0	Lowest value to be used on the data axis of the histogram and cumulative frequency printouts.
7	11-20	BSUP	F10.0	Largest value to be used on the data axis of the histogram and cumulative frequency printouts.

NOTE: If BOTH parameters BINF and BSUP are set to 0.0, then no limits will be imposed on that axis. In that case the drawing (on paper or on screen) will be limited by DINF and DSUP.

8	1-10	PINF	F10.0	Lowest value to be used on the frequency axis of the histogram and cumulative frequency printouts. This value must be between 0.0 and 100.0.
8	11-20	PSUP	F10.0	Largest value to be used on the frequency axis. This value must be between 0.0 and 100.0.

NOTE: If BOTH parameters PINF and PSUP are set to 0.0, then the drawings (on paper or on screen) will be scaled according to the largest percentage found in a data class.

IMPORTANT:

Cards 4 to 8 inclusive are repeated for each of the NBVAR variables to be read. This insures that each variable can be uniquely handled independantly of all the other.

9	1-80	FMTI	20A4	Input data format. This format must allow for NBREST restrictions (if any) followed by NBVAR variables.

TEST_RUN

PROGRAM HISTO

FIRST FEW LINES OF FILE "COMP3D.DAT"
(USED AS INPUT FILE FOR TEST RUN)

-6702	25	.0	-17.5	1812.5	.000	.000
-6702	24	.0	-42.5	1787.5	.086	.028
-6702	23	.0	-67.5	1762.5	.216	.089
-6702	22	.0	-92.5	1737.5	.206	.117
-6702	21	.0	-119.4	1712.5	.273	.395
-6702	20	.0	-148.1	1687.5	.327	.335
-6702	19	.0	-176.9	1662.5	.301	.282
-6702	18	.0	-205.7	1637.5	.467	.376
-6702	17	.0	-234.4	1612.5	.463	.437
-6702	16	.0	-263.2	1587.5	.162	.082
-6702	15	.0	-292.5	1562.5	.000	.000
-6702	14	.0	-322.2	1537.5	.000	.000
-6702	13	.0	-352.0	1512.5	.000	.000
-6704	26	.0	-400.0	1837.5	.000	.000
-6704	25	.0	-400.0	1812.5	.000	.000
-6704	24	.0	-400.0	1787.5	.000	.000
-6704	23	.0	-400.0	1762.5	.000	.000
-6704	22	.0	-400.0	1737.5	.000	.000
-6704	21	.3	-399.7	1712.5	.000	.000
-6704	20	.9	-399.1	1687.5	.000	.000
-6704	19	1.5	-398.5	1662.5	.173	.145
-6704	18	2.2	-397.8	1637.5	1.791	1.349
-6704	17	2.8	-397.2	1612.5	.658	.904
-6704	16	3.4	-396.6	1587.5	.625	.704
-6704	15	4.0	-396.0	1562.5	.930	1.339
-6704	14	4.6	-395.4	1537.5	1.253	1.111
-6704	13	5.2	-394.8	1512.5	.000	.000
-6706	26	400.0	.0	1837.5	.000	.000
-6706	25	400.0	.0	1812.5	.000	.000
-6706	24	400.0	.0	1787.5	.000	.000
-6706	23	400.0	.0	1762.5	.645	.214
-6706	22	400.0	.0	1737.5	.000	.000
-6707	26	400.0	-400.0	1837.5	.000	.000
-6707	25	400.0	-400.0	1812.5	.000	.000
-6707	24	400.0	-400.0	1787.5	.000	.000
-6707	23	400.0	-400.0	1762.5	.404	.404
-6707	22	400.0	-399.3	1737.5	.436	.336
-6707	21	400.0	-398.0	1712.5	.405	.326
-6707	20	400.0	-396.7	1687.5	.852	.566
-6707	19	400.0	-395.4	1662.5	.960	.734
-6707	18	398.9	-394.0	1637.5	.812	.866
-6707	17	396.8	-392.5	1612.5	.436	.518
-6707	16	394.6	-391.0	1587.5	.022	.234
-6707	15	392.5	-389.5	1562.5	.000	.000
-6707	14	390.3	-388.0	1537.5	.000	.000
-6708	27	1200.0	-400.0	1862.5	.000	.000
-6708	26	1200.0	-400.0	1837.5	.000	.000
-6708	25	1200.2	-399.8	1812.5	.000	.000
-6708	24	1200.5	-399.5	1787.5	.000	.000
-6708	23	1200.9	-398.9	1762.5	.000	.000
-6708	22	1201.4	-398.0	1737.5	.000	.000
-6708	21	1202.7	-396.6	1712.5	.160	.206
-6708	20	1204.7	-395.0	1687.5	1.178	1.017
-6708	19	1206.8	-393.8	1662.5	1.252	1.345
-6708	18	1208.8	-393.0	1637.5	1.303	1.525
-6708	17	1211.7	-392.5	1612.5	.852	1.451
-6708	16	1215.5	-392.3	1587.5	.400	1.174
-6708	15	1219.2	-393.9	1562.5	.437	.670
-6708	14	1222.8	-397.2	1537.5	.273	.328
-6801	28	1600.0	-400.0	1887.5	.000	.000
-6801	27	1600.0	-400.0	1862.5	.000	.000
-6801	26	1600.0	-400.0	1837.5	.000	.000
-6801	25	1600.0	-400.0	1812.5	.000	.000

1) INPUT CONTROL PARAMETERS DATA FILE : HISTO.CTL

```
 TEST DEPOSIT - PROGRAM HISTO
000 0 2
HISTOGRAM ON RAW Ni VALUES
00 80
0.001      1000.0
0.0        0.0
0.0        0.0
HISTOGRAM ON LOG. Cu VALUES
10 80
0.001      1000.0
0.0        0.0
0.0        0.0
(45X,2F10.3)
```

LINE	COMMENT
1	Main Title card
2	No echo printing of input data; no restriction on the input file and 2 variables (Ni,Cu) will be analysed.
3-7	Subtitle for variable Ni analysis; histogram and cumulative histogram will be calculated on raw values of the variables which are within the limits 0.001 and 1000.0.
8-12	Subtitle for variable Cu analysis; histogram and cumulative histogram will be calculated on logarithmic values of the variables which are within the raw limits of 0.001 and 1000.0.
13	Format to read Ni and Cu from the input file; (COMP3D.DAT)

TEST RUN

Print out of program compos (file FOR06.DAT)

```
*************************************************************
**** G E O S T A T I S T I C A L   P A C K A G E ****
****     PROGRAM     HISTO     VERSION   V2.3     ****
**** COPYRIGHT GEOSTAT SYSTEMS INTERNATIONAL 1983 ****
*************************************************************


TITLE :
TEST DEPOSIT - PROGRAM HISTO
PROGRAM OPTIONS :

IECHO  : 0 +++ IPRINT : 0 +++ IDEBUG : 0
NBPEST : 0 +++ NDVAR  : 2 +++ IIII   :10


VARIABLE # 1
SUB-TITLE :
HISTOGRAM ON RAW Ni VALUES

VARIABLE OPTIONS :
ILOG   : 0 +++ IMISS  : 0
PLOT WIDTH :  80

MISSING VALUE INDICATOR          :  ** NONE **
LIMITS ON THE VARIABLE VALUES    :   .1000000E-02  .1000000E+04
LIMITS ON THE DATA          AXIS :  ** DETERMINED INTERNALLY **
LIMITS ON THE FREQUENCY     AXIS :  ** DETERMINED INTERNALLY **


VARIABLE # 2
SUB-TITLE :
HISTOGRAM ON LOG Cu VALUES

VARIABLE OPTIONS :
ILOG   : 1 +++ IMISS  : 0
PLOT WIDTH :  80

MISSING VALUE INDICATOR          :  ** NONE **
LIMITS ON THE VARIABLE VALUES    :   .1000000E-02  .1000000E+04
LIMITS ON THE DATA          AXIS :  ** DETERMINED INTERNALLY **
LIMITS ON THE FREQUENCY     AXIS :  ** DETERMINED INTERNALLY **
INPUT FORMAT :
(45x,2F10.3)

TEST DEPOSIT - PROGRAM HISTO
HISTOGRAM ON RAW Ni VALUES


LIMITS ON THE VARIABLE :   .1000000E-02  .1000000E+04
LIMITS ON THE DATA AXIS:   .4000000E-01  .2272000E+01
LIMITS ON THE FREQ AXIS:   .0000000E+00  .8865249E+01


SAMPLES DISTRIBUTION INFORMATIONS

NUMBER OF SAMPLES    :       554
SAMPLES UNDER MIN.   :       272
SAMPLES OVER  MAX.   :         0
```

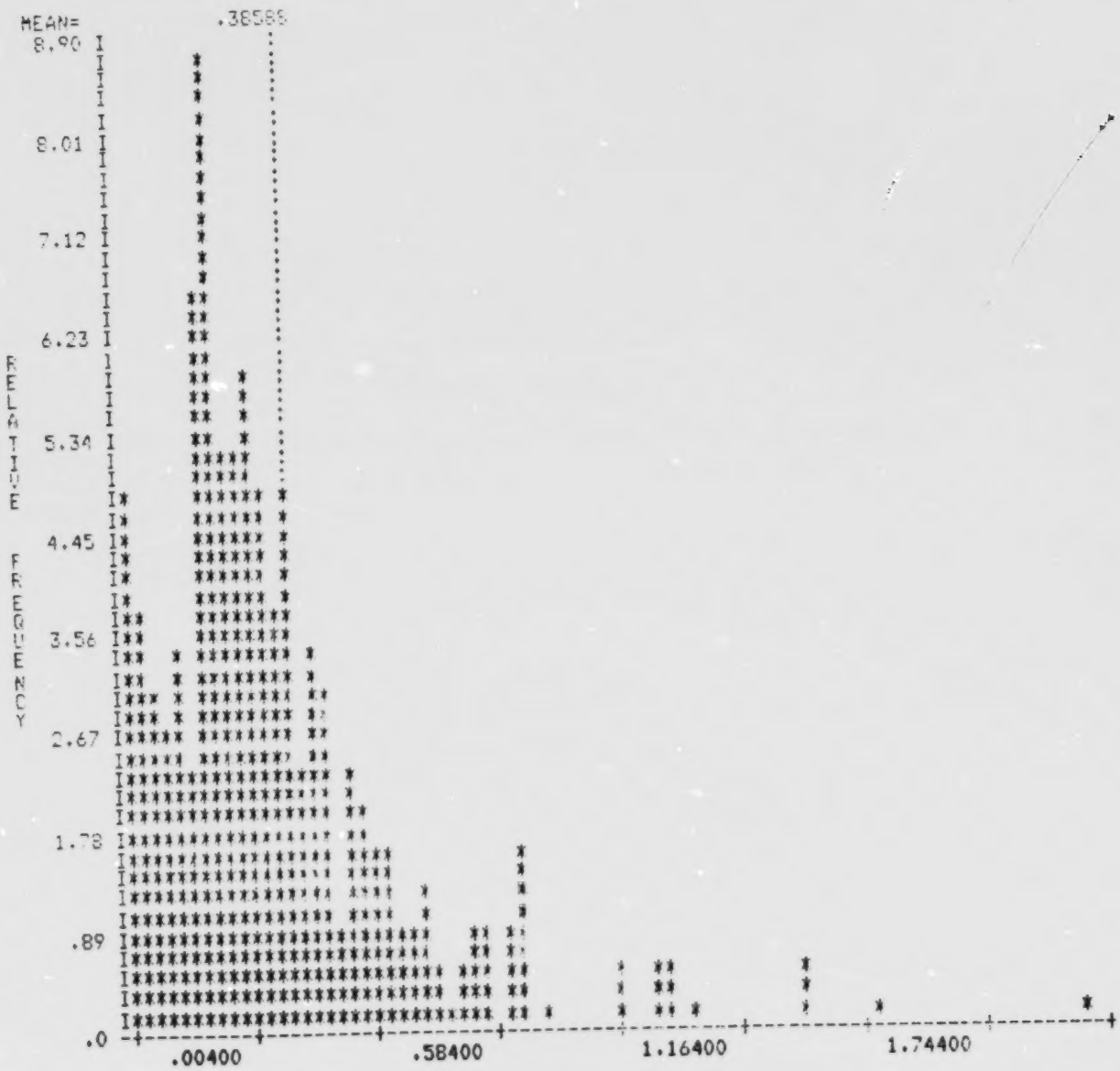
STATISTICS INFORMATION

SAMPLES KEPT	:	282
AVERAGE	:	.38588
VARIANCE	:	.10122
STANDARD DEVIATION	:	.31815

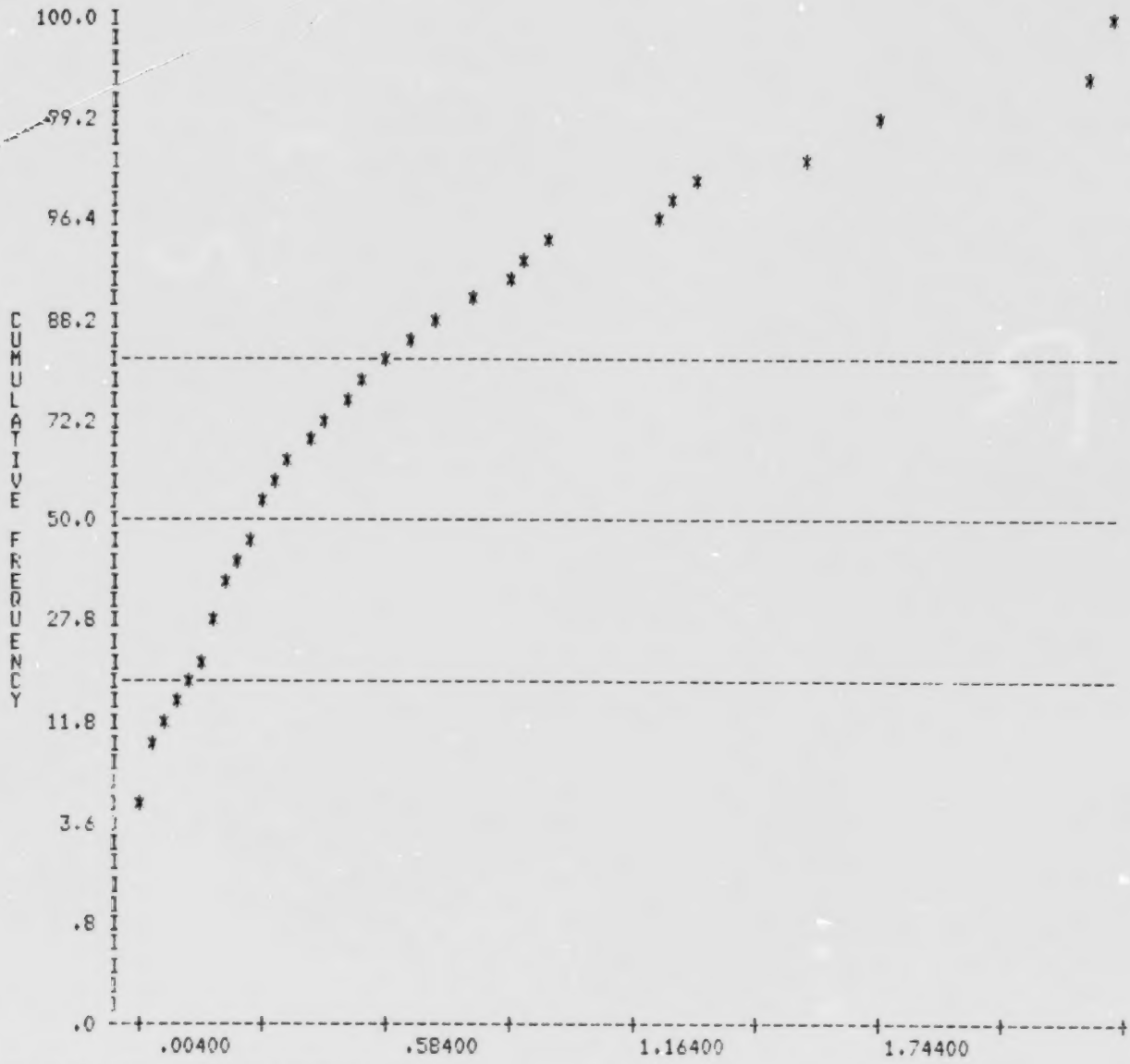
LOGARITHMIC STATISTICS

SAMPLES KEPT	:	282
AVERAGE	:	-1.31496
VARIANCE	:	.98630
STANDARD DEVIATION	:	.99312

TEST DEPOSIT - PROGRAM HISTO
HISTOGRAM ON RAW N1 VALUES



TEST DEPOSIT - PROGRAM HISTO
HISTOGRAM ON RAW Ni VALUES



TEST DEPOSIT - PROGRAM HISTO
HISTOGRAM ON LOG Cu VALUES

LIMITS ON THE VARIABLE : .1000000E-02 .1000000E+04
LIMITS ON THE DATA AXIS: -.5521461E+01 .9715362E+00
LIMITS ON THE FREQ AXIS: .0000000E+00 .6382979E+01

SAMPLES DISTRIBUTION INFORMATIONS

NUMBER OF SAMPLES	:	554
SAMPLES UNDER MIN.	:	272
SAMPLES OVER MAX.	:	0
OUT BY LOGARITHM	:	0

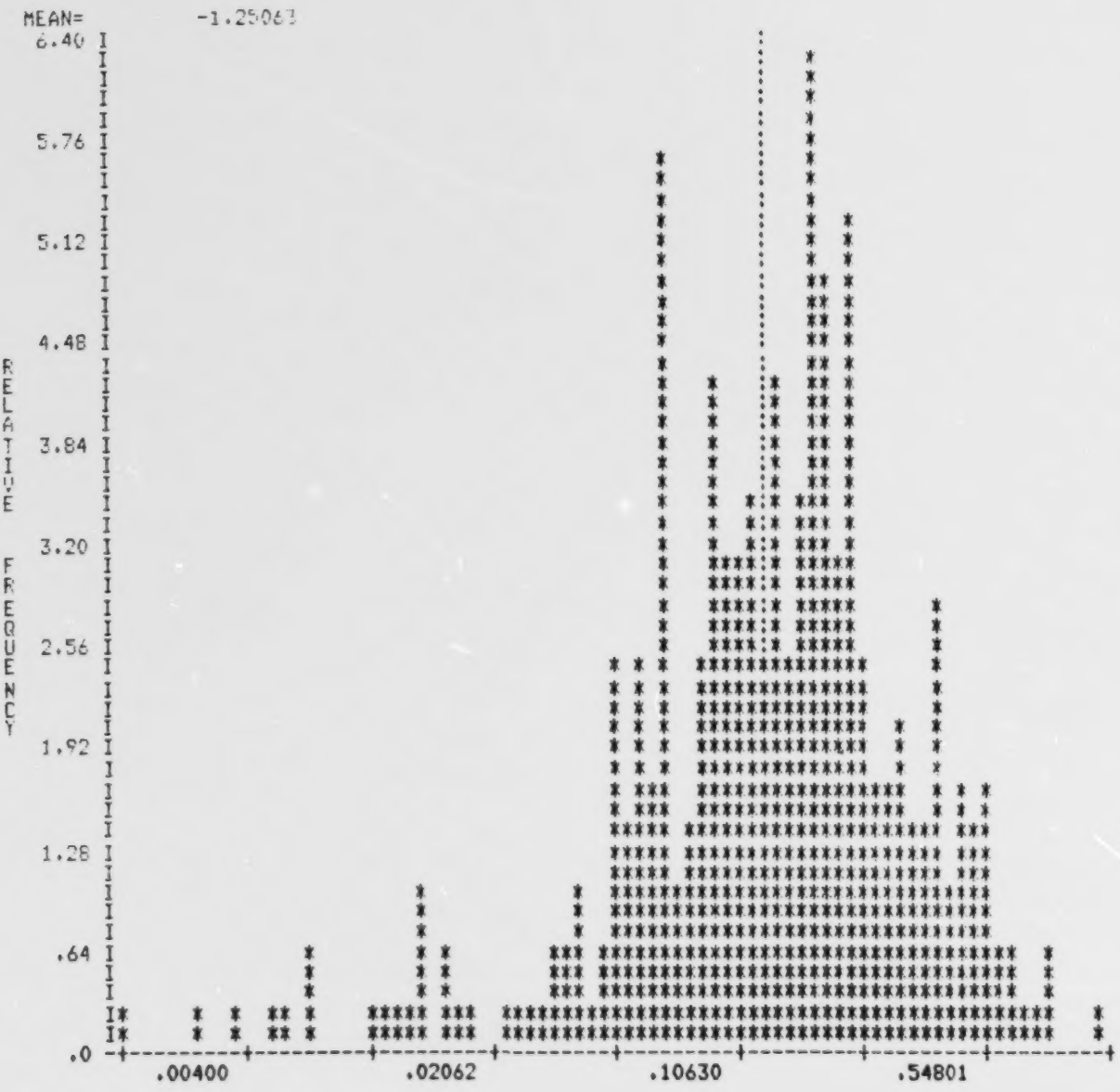
STATISTICS INFORMATION

SAMPLES KEPT	:	282
AVERAGE	:	.43212
VARIANCE	:	.14913
STANDARD DEVIATION	:	.38618

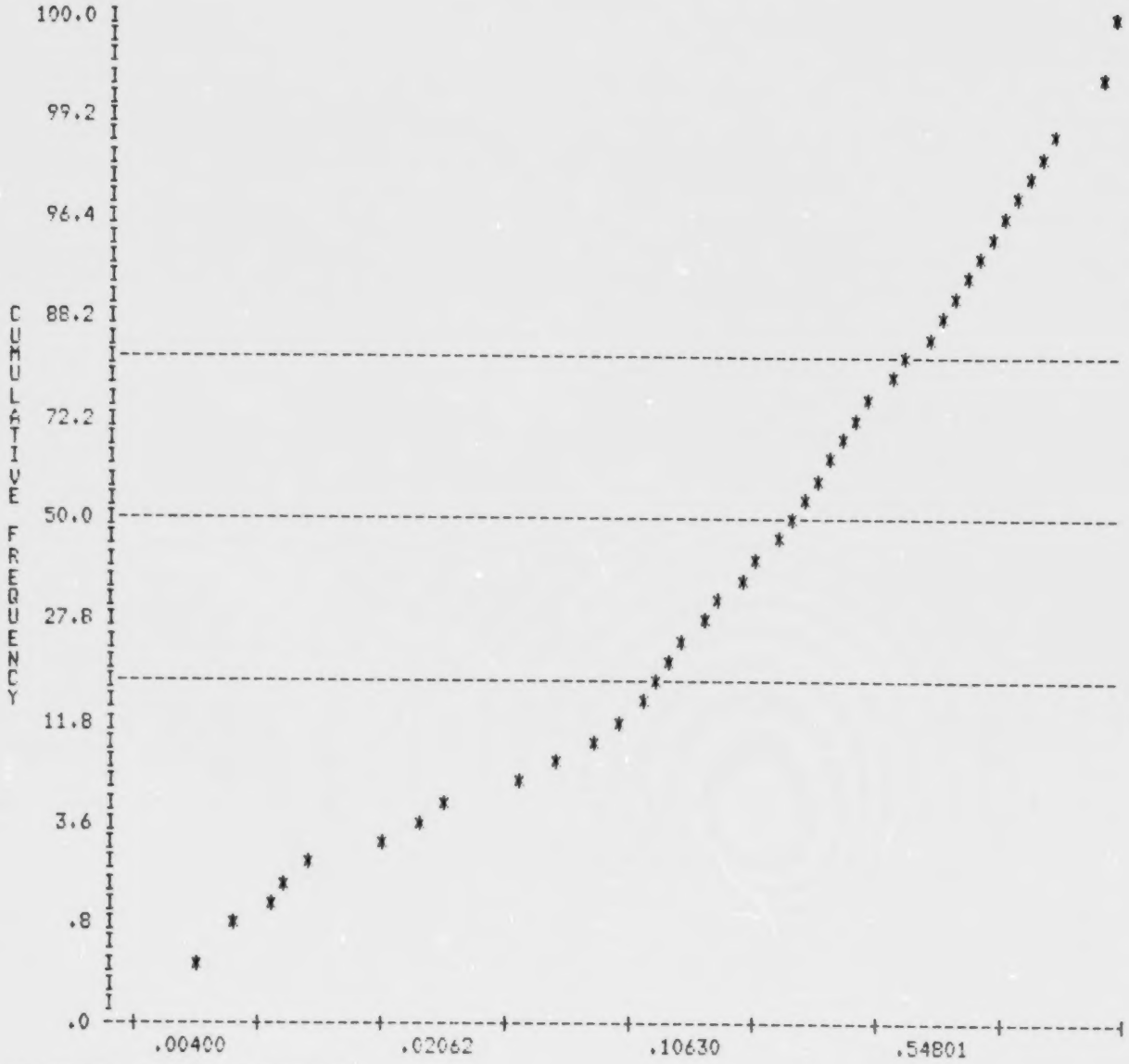
LOGARITHMIC STATISTICS

SAMPLES KEPT	:	282
AVERAGE	:	-1.25063
VARIANCE	:	1.07670
STANDARD DEVIATION	:	1.03764

TEST DEPOSIT - PROGRAM HISTO
HISTOGRAM ON LOG Cu VALUES



TEST DEPOSIT - PROGRAM HISTO
HISTOGRAM ON LOG Cu VALUES



+++ NORMAL END OF PROGRAM +++

GEOSTAT SYSTEMS INTERNATIONAL INC.

V A R I O 3

A PROGRAM TO COMPUTE EXPERIMENTAL
VARIOGRAMS OF SEVERAL VARIABLES
IN 3D.

USER'S GUIDE

VERSION V2.4

Jean-Marc Belisle
Denver, April 1983

VARIO3 INSTALLATION GUIDE

Now that you have received our diskette with the **VARIO3** program, please read these few instructions before using it:

VARIO3 ORGANIZATION

VARIO3 is made of the following files:

VARIO3.BAT: small command file which controls the editing of controls and execution of program

MVARIO3.EXE: program to control the editing of controls with full screen menus

GEOSTAT.EXE: application program itself. It reads the control and input data file(s) and produces all the output files including those for the printer and the plotter

HARDWARE SPECIFICATIONS

VARIO3 runs on IBM PC, XT, AT or compatibles with DOS (Disk Operating System) version 2.0 and following. A minimum of 256K of machine resident memory is necessary. We may accommodate a smaller memory size. Please contact your GSII representative.

VARIO3 also needs a numerical coprocessor (8087 or 80287) on the board to run successfully. A special version for machines without that chip can be prepared on request.

VARIO3 can run on machines with only one floppy disk drive. A second floppy drive or an hard disk are recommended however.

VARIO3 may produce graphics on a plot file. In order to view the graphics, you may need a graphic monitor or a plotter and the corresponding device drivers like **PREPLOT** and **PENPLOT** by GSII.

INSTALLATION OF VARIO3 ON A HARD DISK

The **VARIO3** program that you received has been designed to run from the original diskette without any particular installation procedure. However, if you have a hard disk, you can install some of the program modules on it and run them from there without having to manipulate diskettes. In order to do that we suggest the following procedure:

+ on your hard disk, create a directory with the name GSIPROG. Make sure that the hard disk is the default drive (the prompt should start with C>). Then enter the DOS command:

MD GSIPROG

+ next, you go to this directory with the DOS command:

CD GSIPROG

(Note: if you have specified PROMPT PQ$G before or if you have this command in your AUTOEXEC file, the prompt on your screen should now be: C:\GSIPROG=>

+ take your write-protected diskette of **VARIO3** and place it in drive A

+ copy the command file of **VARIO3** from the diskette to the hard disk with the DOS command:

COPY A:VARIO3.BAT

+ copy the control editing module of **VARIO3** from the diskette to the hard disk with the DOS command:

COPY A:MVARIO3.EXE

+ copy the application program itself from the diskette to the hard disk. Now, we will change its name on the hard disk to avoid any confusion with other GSII programs that you may want to install in the same way. The DOS command to use is:

COPY A:GEOSTAT.EXE CVARIO3.EXE

Once this operation is completed you should have on the GSIPROG directory of your hard disk the following files (you can check it with a DIR command): VARIO3.BAT, MVARIO3.EXE, CVARIO3.EXE. You can now remove the diskette from the drive and store it in a safe place since you no longer need it.

The last operation is the editing of the VARIO3.BAT file to reflect the new organization of your program. You can use any editor that you are used to on your machine or the EDLIN editor of DOS. Changes are:

line 3: change **"A:MVARIO3"** into **"MVARIO3"**

line 6: change **"A:GEOSTAT"** into **"CVARIO3"**

Note: if you wish to be able to run **VARIO3** from any directory of your hard disk, we suggest that you include the following DOS command in your AUTOEXEC file: **PATH = C:\GSIPROG**

RUNNING THE DEMO CASE

VARIO3 is supplied with data files to let you reproduce a demo

case that is described in the last section ofthis manual. There are two control files **VARIO31.CTL** and **VARIO32.CTL** and data file**COMP3D.DAT**. The procedure to run the demo dependsof the installation of the program.

+ Running the demo case from the original diskette

Take the original diskette, remove the write protection tab and insert the diskette in drive A. You can "boot" directly on the diskette if your machine is off (in that case, make sure that drive **A** is closed and simply turn the machine on) or you enter: **A:VARIO3.**

On your screen, you get a banner with the program name and version number. Press any key and you get a "Main Menu" on the screen. At that point you may want to look at the controls for the demo case in file **VARIO31.CTL** (or **VARIO32.CTL**) using option 2 (see section on control menusbelow). If you have a color monitor, youmay also try option 5. However,to runthe demo case, you need use option 1 (for **EXECUTE**). At that point the menu disappears from the screen and after a while another banner with program name and version number shows up. It is immediately followed by the prompt:

ENTER PRINTER OUTPUT FILE: [FORO6.DAT]

For this demo case, we suggest thatyou enter **USER** in order to see the printout of the execution of the program on the screen. Then you see the banner a second time and the next prompt is:

ENTER CTRL PARAMETER FILE

Enter: **A:VARIO31.CTL** (or **A:VARIO32.CTL**)

Next prompt is:

ENTER MAIN DATA FILE

Enter: **A:COMP3D.DAT**

Next prompt is:

ENTER PLOTTING DATA FILE

Enter: **A:DRIVER.PLT**

At that point, you start seeing the printout of the execution on the screen. If it goes too fast, you can stop it by pressing the **<CTRL>** and **<S>** keysat the same time. Press the same two keys to resume execution. When everything is finished the message **"Stop - Program terminated"** appears on the screen and soon you are back to the original welcome banner. Press any key to get to the main menu again. Then select option 4 to get back to the DOS

operating system. Remove the diskette from the drive and put the write protection tab back on it.

Note: If you do not want to write on your original diskette, printer or any output files can be stored on a diskette in a second floppy drive or your hard disk (e.g. **B:VARIO3.PRT** or **C:VARIO3.PRT** instead of USER for the printer output file.

+ Running the democase from the hard disk

We assume that you have installed the programs on the directory **GSIPROG** of your hard disk as explained before. The default drive is the hard disk (prompt C>). If you do not have a path to **GSIPROG** in your AUTOEXEC procedure, you need get to that directory before you start the procedure with the DOS command:

CD GSIPROG

In both cases, you start by entering: **VARIO3**

On your screen, you get a banner with the program name and version number. Press any key and you get a "Main Menu" on the screen. At that point you may want to look at the controls for the demo case in file **VARIO31.CTL** (or **VARIO32.CTL**) using option 2 (see section on control menus below). If you have a color monitor, you may also try option 5. However, to run the demo case, you need use option 1 (for EXECUTE). Before you do that, make sure that you have the original diskette in drive A. You do not have to remove the write protection tab however. Menu disappears from the screen and after a while another banner with program name and version number shows up. It is immediately followed by the prompt:

ENTER PRINTER OUTPUT FILE: [FORO6.DAT]

For this democase, we suggest that you enter **USER** in order to see the printout of the execution of the program onthe screen. Then you see the banner a second time and the next prompt is:

ENTER CTRL PARAMETER FILE:

Enter: **A:VARIO31.CTL** (or **A:VARIO32.CTL**)

Next prompt is:

ENTER MAIN DATA FILE:

Enter: **A:COMP3D.DAT**

Next prompt is:

ENTER PLOTTING DATA FILE:

Enter: **DRIVER.PLT**

At that point, you start seeing the printout of the execution on the screen. If it goes too fast, you can stop it by pressing the **<CTRL>** and **<S>** keys at the same time. Press the same two keys to resume execution. When everything is finished the message **"Stop - Program terminated"** appears on the screen and soon you are back to the original welcome banner. Press any key to get to the main menu again. Then select option 4 to get back to the DOS operating system.

LOOKING AT GRAPHICS OF DEMO CASE

In the demo cases of **VARIO3**, variograms are plotted on diagrams which are stored in file **DRIVER.PLT** either on the original diskette or the hard disk depending of the drive specified for that file. You can look at these diagrams on a graphic monitor or directly a plotter by processing **DRIVER.PLT** through device drivers like GSII's **PREPLOT** and **PENPLOT**. You can also enter the plot file into **AUTOCAD*** through GSII's interface program **IN2CAD**.

RUNNING YOUR OWN CASE

The procedure is the same as for the demo case except that you need supply your own control and input data files. You can use options 2 and 3 of the main menu to generate your own control files (see below). Input data file can be on diskette or hard disk. Make sure that you always use the right device identifier when you answer the prompts (e.g. **B:MYFILE.DAT** if input data is on drive B).

EDITING CONTROLS THROUGH MENU PROCEDURE

Controls for the execution of the **VARIO3** program are set in a small input file called the control parameter file (**VARIO31.CTL** or **VARIO32.CTL** for the democase). A full description of the parameters in this file is given in the section "Control Card Description" of this manual. Based on this description, you can use a text editor on your machine (like EDLIN of DOS) to set the controls in that file. The alternative is to use the menu facility supplied with the program. To do that, you just select option 2 (**"Edit a previous control file"**) or 3 (**"Create a new control file"**) of the program's main menu. In the first case you are prompted for

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the name of the control file to edit. Then you get to the first page of the control editing menu. You will notice the cursor in the first field to be filled. Fill the field as required: hitting the <**RETURN**> key will bring the cursor to the next field, and so on.

If you wish to go down or up through a menu page without changing any parameter, use key arrow down and arrow up respectively.

At the bottom of the screen you see a choice of options in reverse video:

Escape, to return to the main menu

Page down, to get to the next page of the menu (for last page, to get back to page one)

Page up, to get back to the previous page (for page one, to get to the last page of the menu)

Replace or **Insert** mode, to know whether you are in insert or replace mode

Note that all the keys are active, for instance if after field 10 you realize that you made a mistake in field 5, you can get back there with the arrow keys.

The second page will appear automatically after the <**RETURN**> you entered after filling the last field of the first page.

If, when in the second page, you want to go back to page one, press <**PAGE UP**>. When you have finished entering all your values, press <**ESCcape**> key. You will then have to name the control file you have just created or edited. Make sure you do not choose a name already in existence unless you want to erase the old version of the control file. If you just edited an existing control file the name of this file is the default of the prompt.

If you do not want to keep the controls at all, press the <**ESCcape**> key a second time.

Once you have entered the name of the new control file and pressed the <**RETURN**> key, you are back to the main menu.

DESCRIPTION

INTRODUCTION

Program **VARIO3** is an efficient variogram computing program written in FORTRAN 77. It can handle problems in two (2) or three (3) dimensions, compute variograms for several variables in a single pass as well as print and/or plot four (4) types of experimental variograms in as many as five (5) directions.

Several options are available that enable the user to specify the number and types of variables and variograms to be used.

VARIOGRAM COMPUTATIONS

Four types of variograms ARE ALWAYS COMPUTED BY **VARIO3** regardless of the selected options: an absolute variogram, a general relative variogram a local relative variogram and finally a logarithmic variogram. The equations for the variograms are:

a) The absolute variogram:

$$\gamma(h) = \frac{1}{2}\left[\Sigma\ (t_{(x)} - t_{(x+h)})^2\right] /np$$

b) The general relative variogram:

$$\gamma_{rg}(h) = \frac{1}{2}\left[\left[\Sigma(t_{(x)} - t_{(x+h)})^2\right]/np\right] \Big/ \left[\left[\Sigma(t_{(x)} + t_{(x+h)})\right] / 2np\right]^2$$

c) The local relative variogram:

$$\gamma_{r\ell}(h) = \frac{1}{2}\left[\Sigma\ \left((t_{(x)} - t_{(x+h)})^2 / ((t_{(x)} + t_{(x+h)}) / 2)^2\right)\right] /np$$

d) the logarithmic variogram:

$$\gamma_{\ell n}(h) = \frac{1}{2}\left[\Sigma\ (\ell n(t_{(x)}) - \ell n(t_{(x+h)}))^2\right] /np$$

In these equations, γ (x) is grade at point x, γ (x+h) is grade at point x+h and np is the number of pairs of samples separated by vector h.

VARIOGRAM USAGE

Only the absolute and general relative models should be used for simple kriging while the logarithmic model may be used for lognormal kriging. The local relative variogram CANNOT BE USED for simple kriging or lognormal kriging. One should use it only "qualitatively" since it is generally more "robust" and thus gives a somewhat better picture of the underlying structure.

IRREGULARLY GRIDDED DATA

VARIO3 can compute variograms on irregularly gridded data, using "regularization" parameters specified by the user.

When specifying a direction (PHI) along which the variogram will be computed, the user must also provide an angular window that is called a "regularization angle (PSI)". This angle is centered on the angular direction (figure 1) so that any pair falling within the angular sector thus defined is taken as being on the actual direction.

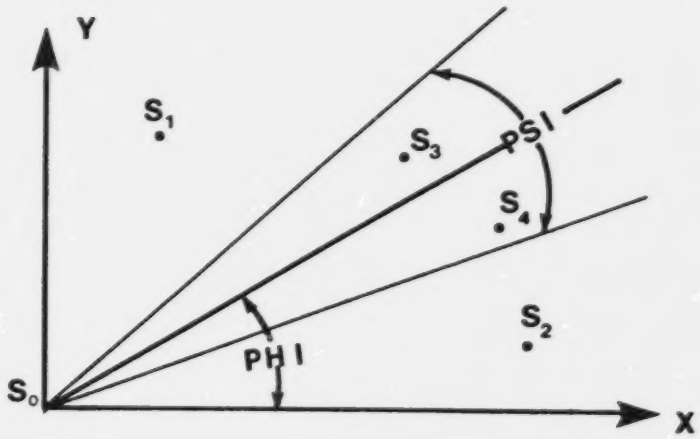

Figure 1: S0=reference sample - S1 and S2 are rejected - S3 and S4 are accepted

The reader should note that by specifying a "regularization angle" of 180 degrees all possible pairs of points will be used in the computation of a variogram that will be in effect "the average variogram" (thus non directional) over the whole plane.

Because the distance (h) separating the points of contributing pairs are not multiples of an elementary distance, the program must be given a unit distance (STEP) that can be taken on average as this elementary distance. A good approximation would be the average drilling grid size (or a sub-multiple of it), or in the absence of even the shadow of a grid, a value slightly more than the average distance between adjacent holes.

The program proceeds by computing the variogram for all pairs falling within multiples of STEP and gives the value to a point situated at a distance corresponding to the average h of all contributing pairs (figure 2).

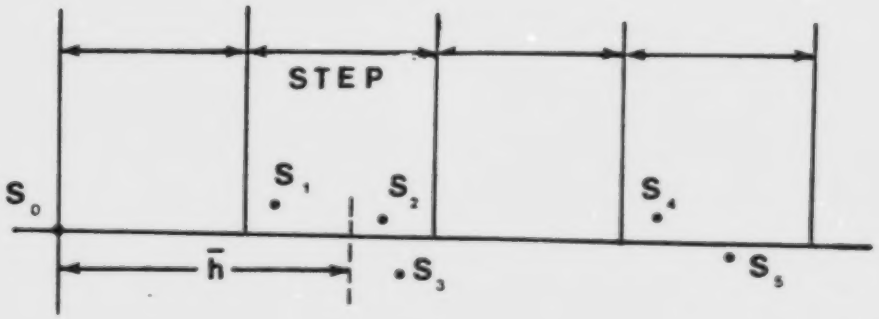

Figure 2

VARIOGRAMS IN 3D

Computing variograms in 3D on irregularly gridded data is usually a time consuming task: Experience has shown that applying the principles used in 2D in the 3D case leads to program run times that quickly become astronomical.

The **VARIO3** program uses shortcuts that permit computations of variograms in MOST 3D DIRECTIONS.

When the IVERT option is set to 1, the program reads 3 coordinates (X,Y,Z) with every sample, and having read the data file, sorts it internally on the Z coordinate.

The user in this case is asked to specify a search radius (ZDMAX) in the Z direction.

Variograms are thus computed in the X-Y plane using (as in 2D) only the samples that fall with the PSI angular window around the PHI direction, but WITH THE ADDED CONDITION that a pair of points is used only if the difference in Z coordinates does not exceed ZDMAX.

As shown in figure 3 the variogram contributing pairs are all the pairs falling within a "pie slice" centered at the origin. The final variogram in direction PHI is thus the average of all variograms computed on slices in the Z direction.

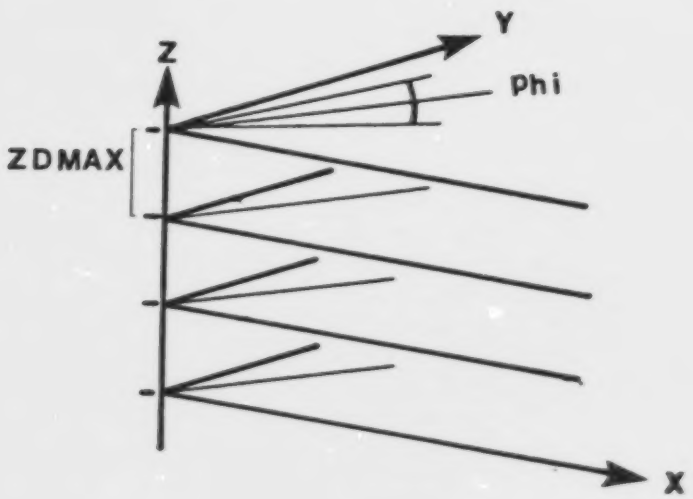

Figure 3

Since the variograms are only computed in the X-Y plane, to compute variograms in other directions, the user has only to invert the (X-Z) or (Y-Z) axes by reading the Z coordinate as the Y and the Y as the Z through control variable ORDER and format commands. Thus variograms computed by **VARIO3** in "what it believes to be" true X and Y plane will actually be computed on (X-Z) or (Y-Z) planes. To simplify the entry of the 3 coordinates, the user can specify the order in which the coordinates are read. For instance, if the user sets ORDER variable to XYZ, the program will assume that the first 3 values read from the data file are the X, Y and Z coordinates, respectively. However, by specifying XZY, the user is forcing the program to take the second coordinate as Z and the third as Y, thus effectively inverting the Y and Z axis.

It should also be noted that using a simple program that performs coordinate rotations, the user will be able to compute variograms in every possible direction. Program ROT is such a program although most program libraries offer an equivalent.

PROGRAM INPUT

VARIO3 reads two input files: one with control parameters and the other one with sample data. These files reside either on diskettes or on a hard disk unit. **VARIO3** prompts the user for the names of the files when the program starts.

On the sample data file, each sample must be positioned by X and Y coordinates (and Z if the IVERT option is set to 1). If GT (grade thickness or accumulation) is desired (IACM set to 1) then each sample record must also contain the length of the sample interval.

Following this information, the NVAR variables (grades) are read.

PROGRAM OUTPUT

+Printer

VARIO3 uses one printer output file with the default name of FOR06.DAT. This name can be user modified at the time of the execution. On this file the program prints back all options as they were read (the user should always check to insure that they were indeed correctly read). It also prints out the exact memory requirements for the run and echoes back (if IECHO is greater than 0) the analyses as they are read.

All four variograms are ALWAYS COMPUTED and the results tabulated for every variable and all selected angles. ONLY THE VARIOGRAM PRINTER AND PLOTTER GRAPHS are affected by the VPRINT and VPLOT options. The user, by the proper setting of these options, controls which variograms are plotted on the printer and/or on the plotter. It is thus advisable to have all variograms initially printed and/or plotted when the initial variogram run is made because computation time is the same whether only one type or all types are printed/plotted, and because one does not know before the initial run which type of variogram model will be most appropriate.

+Plotter

If one of the VPLOT flags is set to 1, **VARIO3** produces a plot file called DRIVER.PLT.

VARIO3 was written using "standard" CALCOMP plotting software routines as described in CALCOMP manuals. This software is widely used in most installations that have plotting equipment from that company and even from competitors.

The variograms are plotted to a size that fits well within a standard 8.5 by 11 inches sheet of paper and can be used directly in reports or publications.

MEMORY REQUIREMENTS

The memory requirements of the program vary according to the options selected: the more directions and variables used, the more memory is needed. All the necessary computation arrays and adders are put in unique vectors "DATA", "IDATA" and "LDATA" in a "driver" main program. If the reserved memory (variable MAXDAT fixed to the maximum of 16384) should prove insufficient for a particular problem (as noted by the program) the user should reduce the number of directions in which variograms are computed.

With "NVAR" variables, and a maximum of "MAXSTP" variogram steps, "NDIR" directions and "NSAMP" samples the required size of arrays "DATA", "IDATA" and "LDATA" is given by the following formula:

```
dimension =  2*NSAMP*(IVERT+NVAR)
            +(MAXSTP*NVAR*NDIR*9)
```

Then if we compute 3D variograms of one variable in 5 directions with 20 variogram values, we can process up to 3871 samples.

CONTROL CARD DESCRIPTION

CARD	COLUMN	VAR.	FMT	DESCRIPTION
1	1-80	TITLE	A80	Title card.
2	1	IECHO	I1	Echo printing option. =0 the input data points are not printed back (default value) =1 only the data points that fall "inside" the area selected for variogram computation are printed =2 all data points are printed back as they are read.
2	2	IPRINT	I1	Not used in this version.
2	3	IDEBUG	I1	Not used in this version.
2	4	IACM	I1	Grade.thickness option =0 only grade values are used =1 variograms are computed on GT (grade*thickness)
2	5	IVERT	I1	3-D variogram option. =0 variograms are computed in the X-Y plane (2-D variogram). =1 variograms are computed in 3-D using X-Y-Z coordinates of samples.
2	6	NDIR	I1	Number of directions along which variograms will be computed. A MAXIMUM OF 5 DIRECTIONS IS ALLOWED.
2	7-8	NVAR	I2	Number of variables to be treated.
2	9-10	IDI1	I2	Dummy
2	11-12	MAXSTP	I2	Maximum number of STEP increments allowed betweem two samples of a pair. (MAXSTP*STEP is thus the maximum distance for which the variogram will be computed.)
3	1-4	VPRINT	4I1	Variogram print/noprint selector (to be applied to each of the 4 types of variograms) (an absolute variogram) (a general relative variogram) (a local relative variogram) (a logarithmic variogram) =0 the associated variogram graph is not traced on the printer. =1 the graph is traced.

4	1-4	VPLOT	4I1	Variogram plot/noplot selector (same as VPRINT above) =0 no plotting is done. =1 the related variogram graph is traced on the plotter.
5	1-3	IHSIZE	I3	Horizontal size (in characters) of the variogram graphs produced on printer. This value should be a multiple of 10 and should not be greater than 100. (Not used if all of VPRINT is set to 0.)
5	4-6	IVSIZE	I3	Vertical size (in lines) of the variogram graphs produced on printer. This value should not exceed 50. (Not used if all of VPRINT is set to 0.)
5	7-16	STEP	F10.0	Unit distance for classification of pairs of variogram sampling.
5	17-26	YCHEL	F10.0	Scaling factor for the variogram axis of variogram prints/plots. The axis is scaled from 0.0 to a value equal to (YCHEL * the variance of the samples). (A value of 3.0 is recommended.)
5	27-36	ZDMAX	F10.0	Maximum distance allowed in the Z direction between two samples of a pair. This value IS USED ONLY WITH "IVERT" SET TO 1.
6	1-10	XMIN	F10.0	Minimum X coordinate allowed for samples.
6	11-20	XMAX	F10.0	Maximum X coordinate allowed for samples.
6	21-30	YMIN	F10.0	Same in Y.
6	31-40	YMAX	F10.0	Same in Y.
6	41-50	ZMIN	F10.0	Same in Z (used only in IVERT=1).
6	51-60	ZMAX	F10.0	Same in Z (used only if IVERT=1).

7*	1-4	VNAME	A4	Variable name (4 characters maximum).
7*	5-14	DMIN	F10.0	Minimum value of variable.
7*	15-24	DMAX	F10.0	Maximum value of variable.

*NOTE: The user should take great care to insure that there are EXACTLY "NVAR" cards of type 7 (one for each variable).

8	1-25	PSI	5F5.0	Angular regularization angles.
9	1-25	PHI	5F5.0	Direction(s) (in degrees) for variogram computations. For example, the east-west direction is equal to 0.0, north-south is equal to 90.0. There must be exactly "NDIR" angles on each of the above cards.
10	1-3	ORDER	3A1	Coordinate order indicator. In 3D (IVERT=1) the value given to ORDER indicates in which order the 3 coordinates occur in the data file. The allowed values are XYZ, XZY, YXZ, ZXY, ZYX. If left blank, then XYZ is assumed. In 2D (IVERT=0) only XY and YX are allowed. If left blank, then XY is assumed.
11}	1-80	FMT	A80	Format of the input sample file.

NOTE The user (in his format) should provide for the reading of the 2 coordinates (3 if IVERT=1), the sample length (ONLY if IACM=1), and the NVAR values of the variables.

TEST RUNS

PROGRAM VARIO3

TEST RUNS

PROGRAM VARIO3

FIRST AND LAST FEW LINES OF FILE "COMP3D.DAT"
(USED AS INPUT FILE FOR TEST RUN)

-6702	25	.0	-17.5	1812.5	.000	.000	
-6702	24	.0	-42.5	1787.5	.086	.028	
-6702	23	.0	-67.5	1762.5	.216	.089	
-6702	22	.0	-92.5	1737.5	.206	.113	
-6702	21	.0	-119.4	1712.5	.273	.395	
-6702	20	.0	-148.1	1687.5	.327	.335	
-6702	19	.0	-176.9	1662.5	.301	.282	
-6702	18	.0	-205.7	1637.5	.467	.376	
-6702	17	.0	-234.4	1612.5	.463	.437	
-6702	16	.0	-263.2	1587.5	.162	.082	
-6702	15	.0	-292.5	1562.5	.000	.000	
-6702	14	.0	-322.2	1537.5	.000	.000	
-6702	13	.0	-352.0	1512.5	.000	.000	
-6704	26	.0	-400.0	1837.5	.000	.000	
-6704	25	.0	-400.0	1812.5	.000	.000	
-6704	24	.0	-400.0	1787.5	.000	.000	
-6704	23	.0	-400.0	1762.5	.000	.000	
-6704	22	.0	-400.0	1737.5	.000	.000	
-6704	21	.3	-399.7	1712.5	.000	.000	
-6704	20	.9	-399.1	1687.5	.000	.000	
						...	===> BREAK
-6922	9	-890.3	-3.7	1412.5	.359	.504	
-6922	8	-887.7	-5.0	1387.5	.612	.433	
-6922	7	-884.2	-7.0	1362.5	.471	.423	
-6922	6	-880.8	-9.0	1337.5	.282	.369	
-6922	5	-877.4	-11.0	1312.5	.939	1.106	
-6922	4	-873.6	-14.0	1287.5	.143	.275	
-6922	3	-869.6	-18.1	1262.5	.000	.000	
-6923	25	-900.0	-200.0	1812.5	.000	.000	
-6923	24	-900.0	-200.0	1787.5	.000	.000	
-6923	23	-900.0	-200.0	1762.5	.000	.000	
-6923	22	-900.0	-200.0	1737.5	.126	.133	
-6923	21	-900.0	-200.0	1712.5	.294	.334	
-6923	20	-900.3	-198.9	1687.5	.269	.135	
-6926	26	3.8	-327.2	1837.5	.000	.000	
-6926	25	7.3	-352.0	1812.5	.000	.000	
-6926	24	10.2	-377.3	1787.5	.000	.000	
-6926	23	2.1	-401.2	1762.5	.000	.000	
-6926	22	-16.4	-423.2	1737.5	.006	.004	
-6926	21	-30.9	-448.5	1712.5	.366	.391	
-6926	20	-32.3	-476.6	1687.5	.186	.278	
-6926	19	-24.9	-504.4	1662.5	.000	.000	

1) TEST RUN #1 - (HORIZONTAL VARIOGRAMS) : INPUT CONTROL FILE (VARIO31.CTL)

```
*** TEST DEPOSIT - PROGRAM VARIO3 - HORIZONTAL VARIOGRAMS
1  015 2   6
0100
0100
70 30      190.0        3.0       20.0
  -10000.0   10000.0  -10000.0   10000.0  -10000.0   10000.0
  Ni      0.001     1000.0
  Cu      0.001     1000.0
180.0 45.0 45.0 45.0 45.0
  0.0  0.0 45.0 90.0135.0
XYZ
(19X,5F10.0)
```

LINE	COMMENT
1	Main title card
2	3D variograms of 2 variables (Ni and Cu) are computed along 5 directions.
3-4	Relative variograms are both printed and plotted.
5	Prints are 70 columns by 30 rows. Interval to classify distances is 190 feet. Maximum difference in elevation is 20 feet hence variograms are computed in each bench and averaged.
6-7-8	No limits on coordinates - Zero grade values of both nickel and copper are excluded.
9-10	An average variogram (PSI=180) and four directional variograms (E-W:0 , NE-SW:45, N-S:90, NW-SE:135) are computed.

2) TEST RUN #1 : PRINTOUT OF PROGRAM (file FOR06.DAT)

```
*********************************************************
**** G E O S T A T I S T I C A L    P A C K A G E ****
****      PROGRAM     VARIO3    VERSION   V2.4      ****
**** COPYRIGHT GEOSTAT SYSTEMS INTERNATIONAL 1983 ****
*********************************************************


*** TEST DEPOSIT - PROGRAM VARIO3 - HORIZONTAL VARIOGRAMS ***


INPUT PARAMETERS :
IECHO    1 +++ IPRINT   0 +++ IDEBUG  0
IACM     0 +++ IVERT    1 +++ NDIR    5
NVAR     2 +++ IDI1    10 +++ MAXSTP  6


VPRINT =    0  1  0  0

VPLOT  =    0  1  0  0

IHSIZE          70 +++ IVSIZE          30
STEP     190.00000 +++ YCHEL      3.00000
ZDMAX     20.00000

XMIN       -10000.00 +++ XMAX        10000.00
YMIN       -10000.00 +++ YMAX        10000.00
ZMIN       -10000.00 +++ ZMAX        10000.00

NO  VARIABLE      MINIMUM          MAXIMUM
 1       Ni      .10000E-02       .10000E+04
 2       Cu      .10000E-02       .10000E+04

ANGULAR DIRECTION(S)   :      .00       .00      45.00      90.00     135.00
ANGULAR REGULARISATION :   180.00     45.00      45.00      45.00      45.00

INPUT COORDINATE ORDER : X Y Z

INPUT FORMAT
(19X,5F10.0)
STUDYING  2 VARIABLES
ALONG  5 DIRECTIONS
(WITH A MAXIMUM OF  6 STEP ELEMENTS)
 3174 SAMPLES CAN BE ACCOMMODATED BY THIS PROGRAM
```

V A R I O G R A M

*** TEST DEPOSIT - PROGRAM VARIO3 - HORIZONTAL VARIOGRAMS ***

VARIABLE (Ni) +++ ANGULAR DIRECTION (.0) +++ ANGULAR WINDOW (180.0)

LOWER BOUND	.10000E-02
UPPER BOUND	.10000E+04
SAMPLE SIZE	282
MEAN	.38588E+00
VARIANCE	.10122E+00
STEP	.19000E+03

FROM	TO	PAIRS	DIST	MEAN	DRIFT	VARIOGRAM	==>
.0	190.0	76	122.41	.51076E+00	.15539E+00	.16386E+00	
190.0	380.0	519	262.43	.42422E+00	.23044E-01	.89847E-01	
380.0	570.0	395	456.54	.41623E+00	.28686E-01	.98454E-01	==>
570.0	760.0	406	647.96	.43037E+00	.50744E-01	.11850E+00	
760.0	950.0	355	844.47	.42394E+00	.61493E-01	.12031E+00	
950.0	1140.0	304	1038.12	.41467E+00	.97875E-01	.12629E+00	==>

===>	G. R. VAR	L.+R.+VAR	PAIRS	DIST	LOG. VAR
	.62813E+00	.41738E+00	76	122.41	.86167E+00
	.49926E+00	.35763E+00	519	262.43	.67609E+00
===>	.56828E+00	.41304E+00	395	456.54	.77597E+00
	.63982E+00	.43716E+00	406	647.96	.81001E+00
	.66941E+00	.47085E+00	355	844.47	.80592E+00
===>	.73443E+00	.49204E+00	304	1038.12	.10452E+01

VARIANCE	=	.10122E+00
GENERAL REL. VAR.	=	.67977E+00
LOCAL REL. VAR.	=	.42564E+00
LOGARITHMIC VARIANCE	=	.98630E+00

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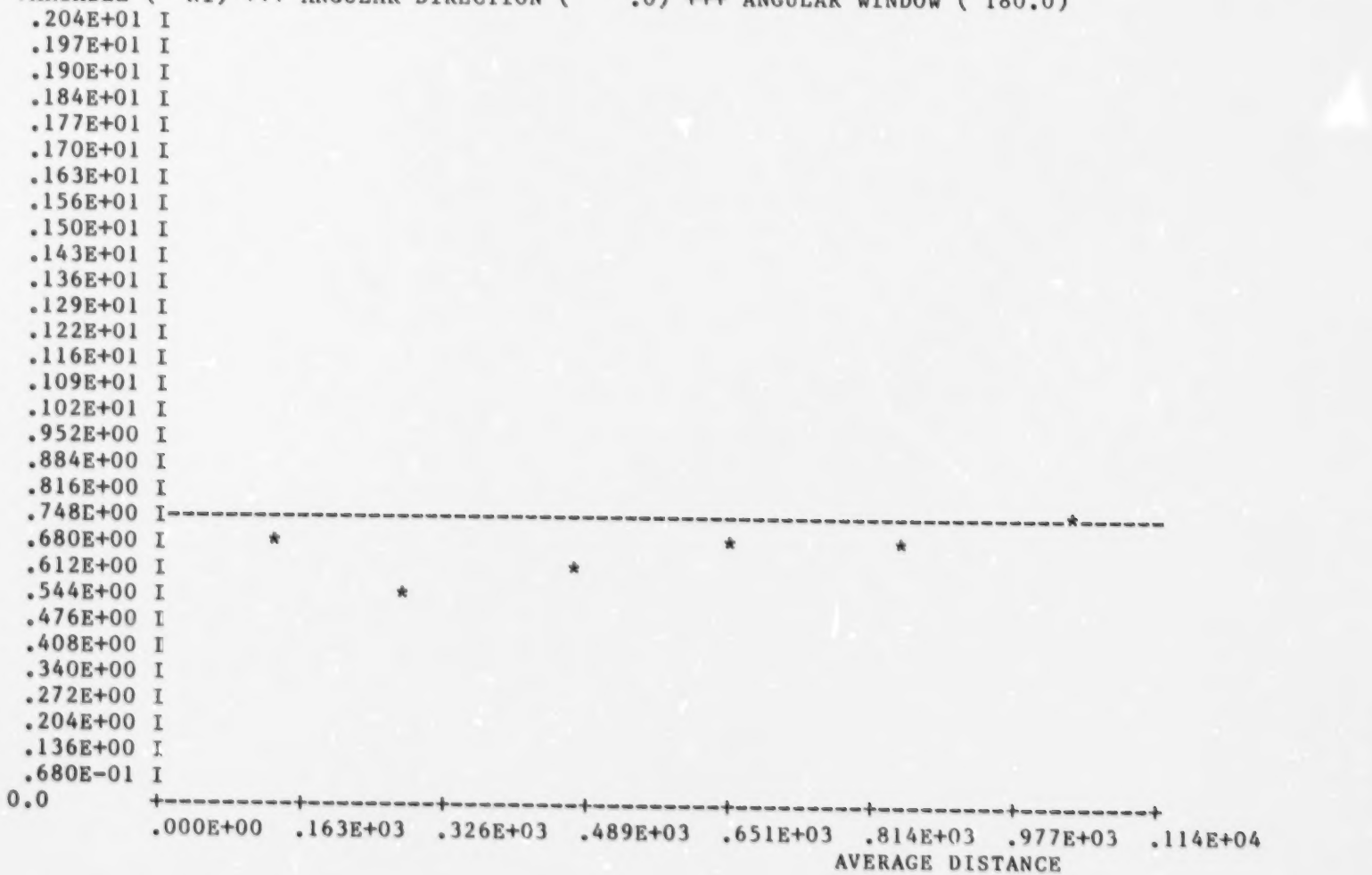
*** TEST DEPOSIT - PROGRAM VARIO3 - HORIZONTAL VARIOGRAMS ***
GENERAL RELATIVE VARIOGRAM

VARIABLE (N1) +++ ANGULAR DIRECTION (.0) +++ ANGULAR WINDOW (180.0)



... ===> BREAK

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V A R I O G R A M

*** TEST DEPOSIT - PROGRAM VARIO3 - HORIZONTAL VARIOGRAMS ***

VARIABLE (Cu) +++ ANGULAR DIRECTION (.0) +++ ANGULAR WINDOW (180.0)

LOWER BOUND	.10000E-02
UPPER BOUND	.10000E+04
SAMPLE SIZE	282
MEAN	.43212E+00
VARIANCE	.14913E+00
STEP	.19000E+03

FROM	TO	PAIRS	DIST	MEAN	DRIFT	VARIOGRAM==>
.0	-- 190.0	76	122.41	.60466E+00	.10957E+00	.20955E+00
190.0	-- 380.0	519	262.43	.47630E+00	.34462E-01	.12223E+00
380.0	-- 570.0	395	456.54	.46022E+00	.20929E-01	.12661E+00==>
570.0	-- 760.0	406	647.96	.48111E+00	.69219E-01	.15941E+00
760.0	-- 950.0	355	844.47	.49160E+00	.99499E-01	.17852E+00
950.0	--1140.0	304	1038.12	.47805E+00	.12796E+00	.18582E+00==>

	G. R. VAR	L.+R.+VAR	PAIRS	DIST	LOG. VAR
===>	.57313E+00	.33526E+00	76	122.41	.60123E+00
	.53876E+00	.35982E+00	519	262.43	.60671E+00
===>	.59778E+00	.43316E+00	395	456.54	.74787E+00
	.68867E+00	.47009E+00	406	647.96	.79039E+00
	.73871E+00	.48678E+00	355	844.47	.81673E+00
===>	.81310E+00	.53660E+00	304	1038.12	.10807E+01

VARIANCE	=	.14913E+00
GENERAL REL. VAR.	=	.79865E+00
LOCAL REL. VAR.	=	.44288E+00
LOGARITHMIC VARIANCE	=	.10767E+01

```
        *** TEST DEPOSIT - PROGRAM VARIO3 - HORIZONTAL VARIOGRAMS ***
                        GENERAL RELATIVE VARIOGRAM
 VARIABLE (  Cu) +++ ANGULAR DIRECTION (     .0) +++ ANGULAR WINDOW ( 180.0)
  .240E+01 I
  .232E+01 I
  .224E+01 I
  .216E+01 I
  .208E+01 I
  .200E+01 I
  .192E+01 I
  .184E+01 I
  .176E+01 I
  .168E+01 I
  .160E+01 I
  .152E+01 I
  .144E+01 I
  .136E+01 I
  .128E+01 I
  .120E+01 I
  .112E+01 I
  .104E+01 I
  .958E+00 I
  .879E+00 I                                                    *
  .799E+00 I----------------------------------------------------*----------------
  .719E+00 I                                   *
  .639E+00 I       *                   *
  .559E+00 I               *
  .479E+00 I
  .399E+00 I
  .319E+00 I
  .240E+00 I
  .160E+00 I
  .799E-01 I
 0.0       +---------+---------+---------+---------+---------+---------+---------+
           .000E+00  .163E+03  .326E+03  .489E+03  .651E+03  .814E+03  .977E+03  .114E+04
                                                  AVERAGE DISTANCE

                                                                  ...  ===> BREAK

           NORMAL END OF PROGRAM
```

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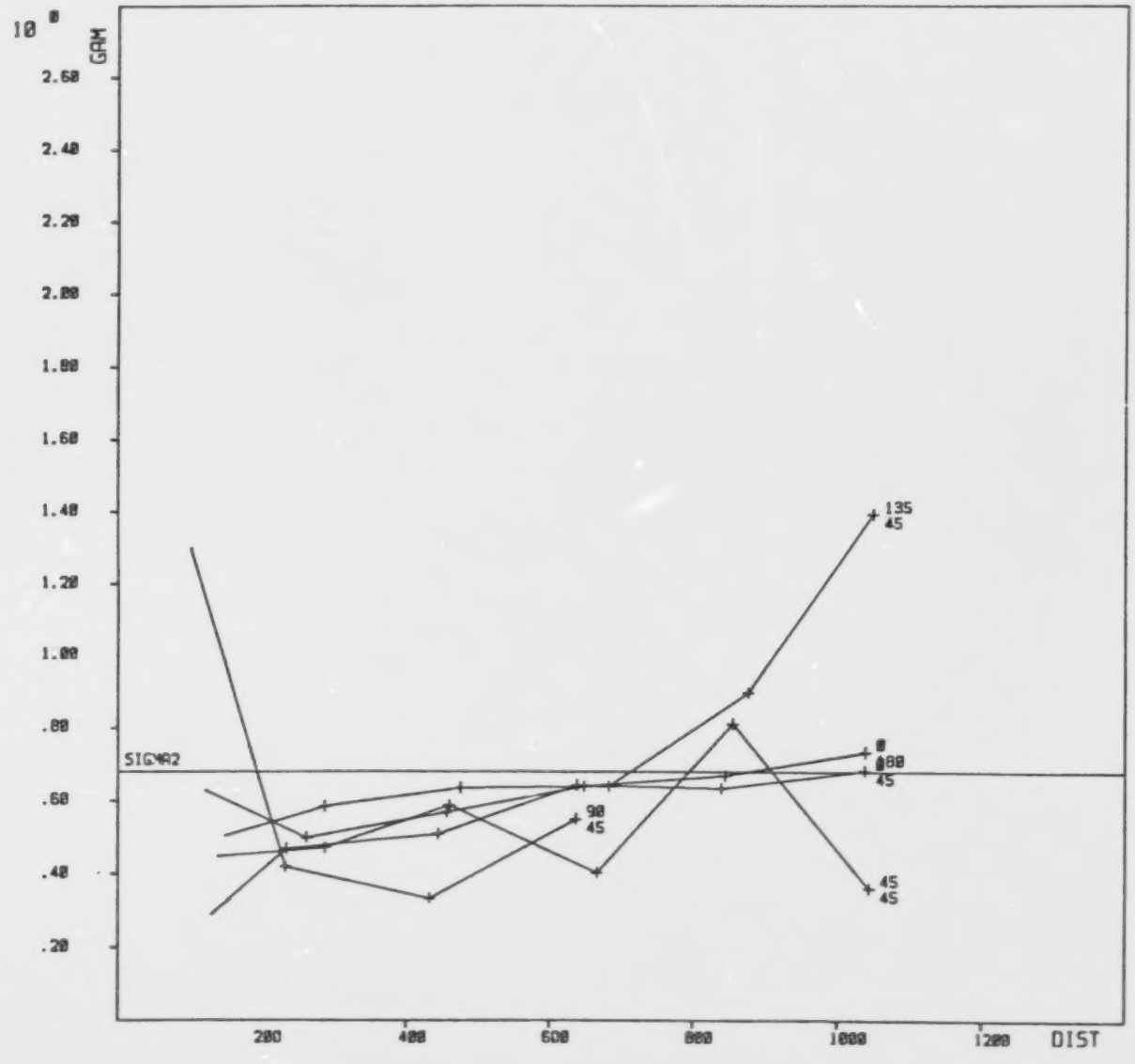
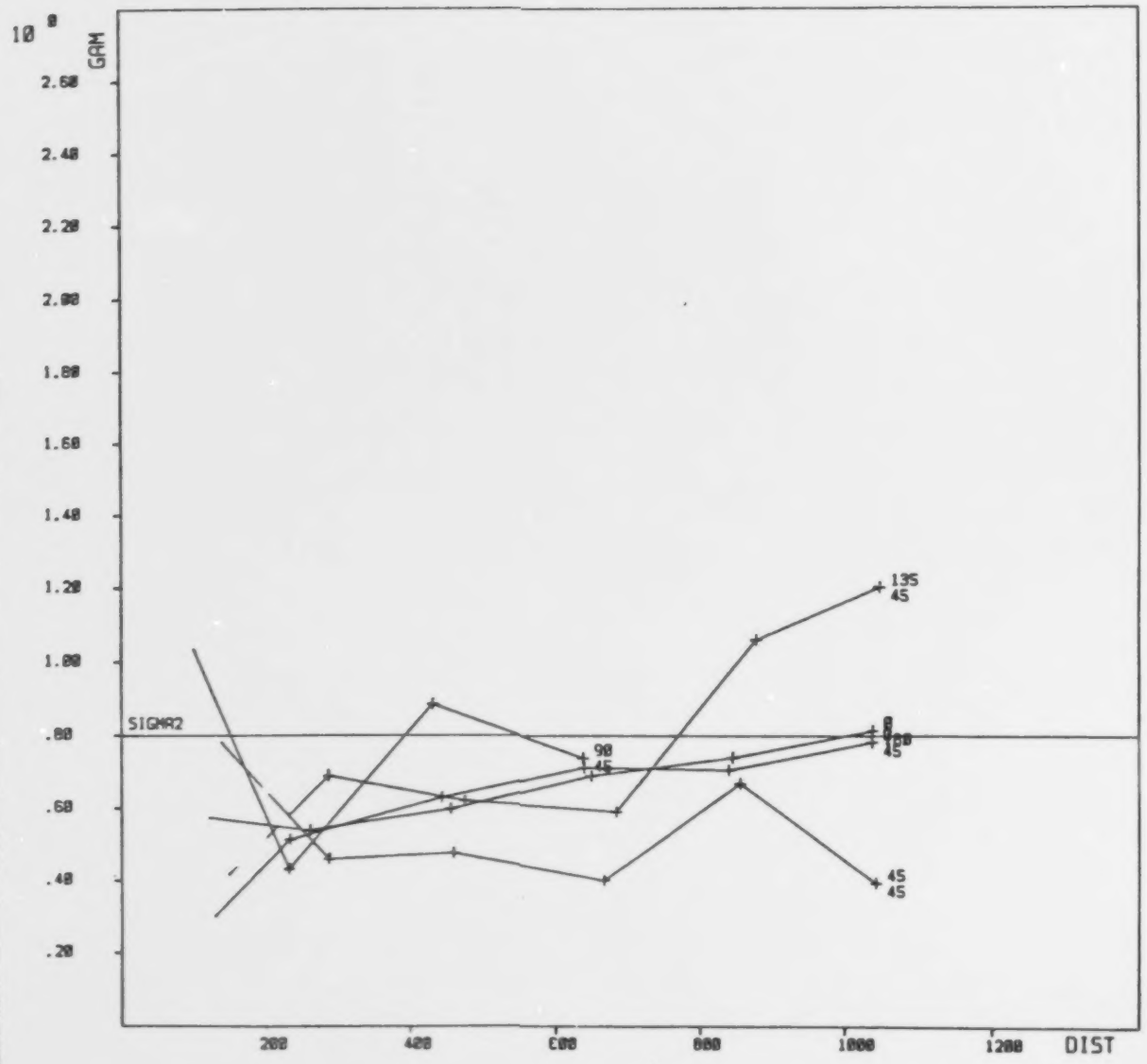
3) TEST RUN #1 : PLOTTER OUTPUT OF PROGRAM (file DRIVER.PLT)



VARIABLE N1 GENERAL RELATIVE VARIOGRAM

*** TEST DEPOSIT - PROGRAM VARIO3 - HORIZONTAL VARIOGRAMS ***



VARIABLE Cu GENERAL RELATIVE VARIOGRAM

■■■ TEST DEPOSIT - PROGRAM VARIO3 - HORIZONTAL VARIOGRAMS ■■■

4) TEST RUN #2 (VERTICAL VARIOGRAM) : input control file (VARIO32.CTL)

```
*** TEST DEPOSIT - PROGRAM VARIO3 - VERTICAL VARIOGRAM
1  011 2  10
0100
0100
 70 30       24.0        3.0       10.0
  -10000.0    10000.0  -10000.0    10000.0  -10000.0    10000.0
   Ni      0.001     1000.0
   Cu      0.001     1000.0
 20.0
  0.0
ZYX
(19X,5F10.0)
```

LINE	COMMENT
2	3D variograms of 2 variables (Ni and Cu) are computed along 1 direction.
3-4	Relative variograms are both printed and plotted.
5	Prints are 70 columns by 30 rows. Interval to classify distances is 24 feet. Maximum difference in easting coordinate is 10 feet, hence variograms are computed in each cross section and averaged.
6-7-8	No limite on coordinates - Zero grade values of both nickel and copper are excluded.
9	Angular tolerance around vertical in cross sections is (+ or -) 1 degrees.
11	For that run X (E-W) is the Z of the program and Z (vertical) is the X of the program.

5) TEST RUN #2 : PRINTOUT OF PROGRAM (file FOR06.DAT)

```
**********************************************************
**** G E O S T A T I S T I C A L    P A C K A G E ****
****      PROGRAM      VARIO3     VERSION   V2.4      ****
**** COPYRIGHT GEOSTAT SYSTEMS INTERNATIONAL 1983 ****
**********************************************************


*** TEST DEPOSIT - PROGRAM VARIO3 - VERTICAL VARIOGRAMS ***


INPUT PARAMETERS :
IECHO    1 +++ IPRINT   0 +++ IDEBUG   0
IACM     0 +++ IVERT    1 +++ NDIR     1
NVAR     2 +++ IDI1    10 +++ MAXSTP  10


VPRINT =    0  1  0  0

VPLOT  =    0  1  0  0

IHSIZE          70 +++ IVSIZE          30
STEP      24.00000 +++ YCHEL      3.00000
ZDMAX     10.00000

XMIN       -10000.00 +++ XMAX        10000.00
YMIN       -10000.00 +++ YMAX        10000.00
ZMIN       -10000.00 +++ ZMAX        10000.00

NO  VARIABLE      MINIMUM          MAXIMUM
 1       Ni      .10000E-02       .10000E+04
 2       Cu      .10000E-02       .10000E+04

ANGULAR DIRECTION(S)    :      .00
ANGULAR REGULARISATION :    20.00

INPUT COORDINATE ORDER : Z Y X

INPUT FORMAT
(19X,5F10.0)
STUDYING  2 VARIABLES
ALONG  1 DIRECTIONS
(WITH A MAXIMUM OF 10 STEP ELEMENTS)
 3238 SAMPLES CAN BE ACCOMMODATED BY THIS PROGRAM
```

+++ ECHO PRINTING OF INPUT DATA +++

1	.17875E+04	-.42500E+02	.00000E+00	.86000E-01
	.28000E-01			
2	.17625E+04	-.67500E+02	.00000E+00	.21600E+00
	.89000E-01			
3	.17375E+04	-.92500E+02	.00000E+00	.20600E+00
	.11300E+00			
4	.17125E+04	-.11940E+03	.00000E+00	.27300E+00
	.39500E+00			
5	.16875E+04	-.14810E+03	.00000E+00	.32700E+00
	.33500E+00			
6	.16625E+04	-.17690E+03	.00000E+00	.30100E+00
	.28200E+00			
7	.16375E+04	-.20570E+03	.00000E+00	.46700E+00
	.37600E+00			
8	.16125E+04	-.23440E+03	.00000E+00	.46300E+00
	.43700E+00			
9	.15875E+04	-.26320E+03	.00000E+00	.16200E+00
	.82000E-01			
10	.16625E+04	-.39850E+03	.15000E+01	.17300E+00
	.14500E+00			

... ===> BREAK

277	.17375E+04	-.20000E+03	-.90000E+03	.12600E+00
	.13300E+00			
278	.17125E+04	-.20000E+03	-.90000E+03	.29400E+00
	.33400E+00			
279	.16875E+04	-.19890E+03	-.90030E+03	.26900E+00
	.13500E+00			
280	.17375E+04	-.42320E+03	-.16400E+02	.60000E-02
	.40000E-02			
281	.17125E+04	-.44850E+03	-.30900E+02	.36600E+00
	.39100E+00			
282	.16875E+04	-.47660E+03	-.32300E+02	.18600E+00
	.27800E+00			

NUMBER OF SAMPLES SUBMITTED = 554
NUMBER OF SAMPLES OUTSIDE = 0
NUMBER OF SAMPLES DELETED = 272
NUMBER OF SAMPLES KEPT = 282

VARIABLE	SAMPLES	MEAN	VARIANCE	N.Z. S.	MEAN	VARIANCE
Ni	282	.38588E+00	.10122E+00	282	-.13150E+01	.98630E+00
Cu	282	.43212E+00	.14913E+00	282	-.12506E+01	.10767E+01

V A R I O G R A M

*** TEST DEPOSIT - PROGRAM VARIO3 - VERTICAL VARIOGRAMS ***

VARIABLE (Ni) +++ ANGULAR DIRECTION (.0) +++ ANGULAR WINDOW (20.0)

LOWER BOUND	.10000E-02
UPPER BOUND	.10000E+04
SAMPLE SIZE	282
MEAN	.38588E+00
VARIANCE	.10122E+00
STEP	.24000E+02

FROM	TO	PAIRS	DIST	MEAN	DRIFT	VARIOGRAM==>
.0 --	24.0	0	.00	.00000E+00	.00000E+00	.00000E+00
24.0 --	48.0	228	25.02	.41942E+00	-.21548E-01	.56275E-01
48.0 --	72.0	190	50.05	.41786E+00	-.50468E-01	.72345E-01
72.0 --	96.0	151	75.06	.41326E+00	-.90437E-01	.81305E-01
96.0 --	120.0	119	100.08	.39573E+00	-.15169E+00	.90277E-01==>
120.0 --	144.0	84	125.08	.37668E+00	-.22185E+00	.10619E+00
144.0 --	168.0	49	150.07	.36257E+00	-.25057E+00	.14756E+00
168.0 --	192.0	29	175.08	.30867E+00	-.22176E+00	.11451E+00
192.0 --	216.0	15	200.09	.30260E+00	-.29800E+00	.15937E+00
216.0 --	240.0	5	225.09	.20470E+00	-.17220E+00	.29114E-01==>

===>	G. R. VAR	L.+R.+VAR	PAIRS	DIST	LOG. VAR
	.00000E+00	.00000E+00	0	.00	.00000E+00
	.31990E+00	.27017E+00	228	25.02	.50131E+00
	.41433E+00	.34705E+00	190	50.05	.58540E+00
	.47607E+00	.37752E+00	151	75.06	.62996E+00
===>	.57648E+00	.44300E+00	119	100.08	.79254E+00
	.74841E+00	.46961E+00	84	125.08	.78116E+00
	.11225E+01	.62661E+00	49	150.07	.11747E+01
	.12019E+01	.73189E+00	29	175.08	.14305E+01
	.17405E+01	.66511E+00	15	200.09	.14561E+01
===>	.69482E+00	.81437E+00	5	225.09	.13399E+01

VARIANCE	=	.10122E+00
GENERAL REL. VAR.	=	.67977E+00
LOCAL REL. VAR.	=	.39389E+00
LOGARITHMIC VARIANCE	=	.98630E+00

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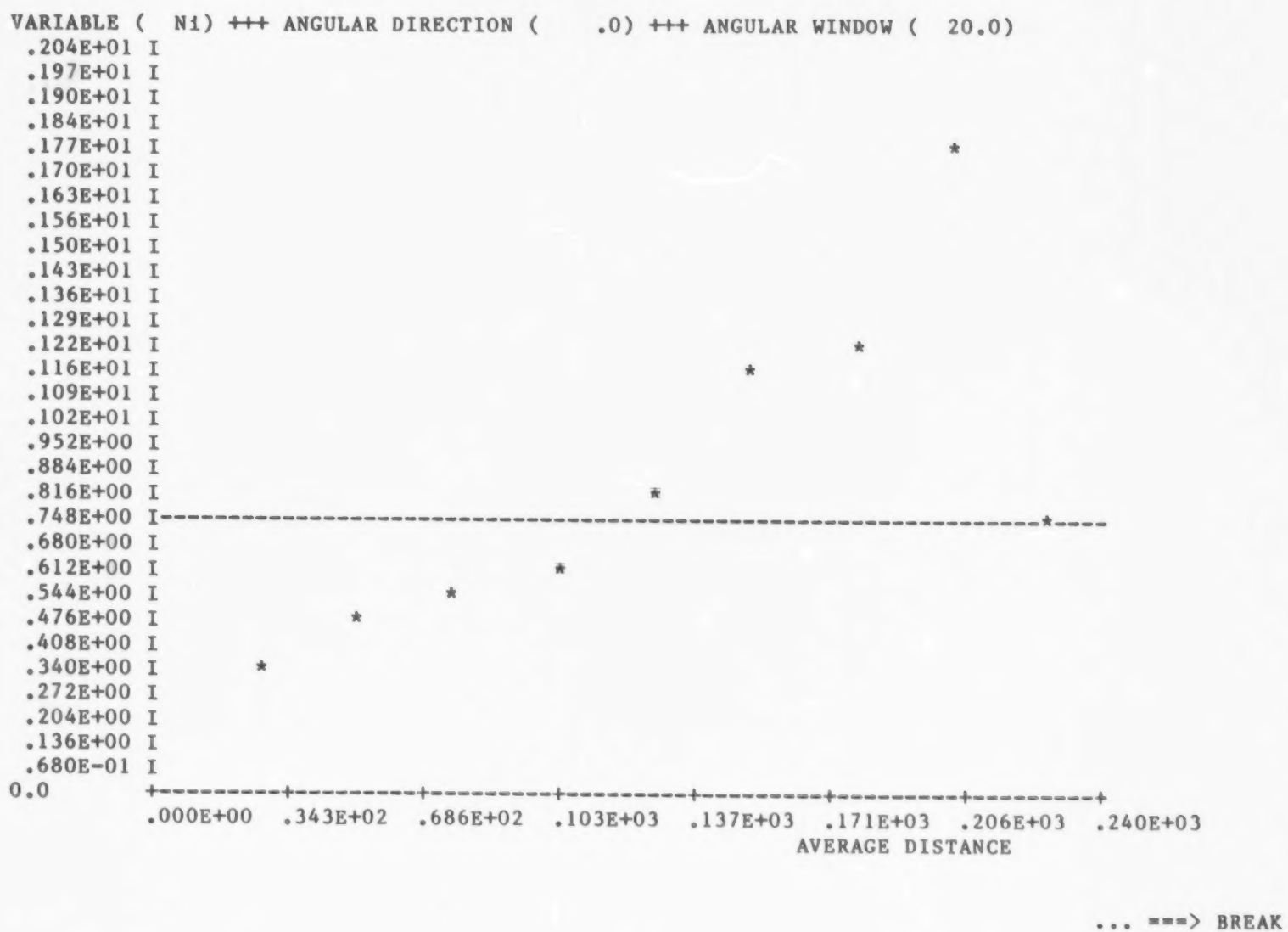
*** TEST DEPOSIT - PROGRAM VARIO3 - VERTICAL VARIOGRAMS ***
GENERAL RELATIVE VARIOGRAM



... ===> BREAK

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V A R I O G R A M

*** TEST DEPOSIT - PROGRAM VARIO3 - VERTICAL VARIOGRAM ***

VARIABLE (Cu) +++ ANGULAR DIRECTION (.0) +++ ANGULAR WINDOW (20.0)

LOWER BOUND	.10000E-02
UPPER BOUND	.10000E+04
SAMPLE SIZE	282
MEAN	.43212E+00
VARIANCE	.14913E+00
STEP	.24000E+02

FROM	TO	PAIRS	DIST	MEAN	DRIFT	VARIOGRAM==>
.0 --	24.0	0	.00	.00000E+00	.00000E+00	.00000E+00
24.0 --	48.0	228	25.02	.47045E+00	-.40219E-01	.74305E-01
48.0 --	72.0	190	50.05	.46696E+00	-.98468E-01	.10242E+00
72.0 --	96.0	151	75.06	.46370E+00	-.17005E+00	.11700E+00
96.0 --	120.0	119	100.08	.43720E+00	-.24014E+00	.14696E+00==>
120.0 --	144.0	84	125.08	.42401E+00	-.32751E+00	.17209E+00
144.0 --	168.0	49	150.07	.40044E+00	-.33655E+00	.21886E+00
168.0 --	192.0	29	175.08	.35071E+00	-.32797E+00	.16265E+00
192.0 --	216.0	15	200.09	.34143E+00	-.38340E+00	.22991E+00
216.0 --	240.0	5	225.09	.24860E+00	-.26200E+00	.89775E-01==>

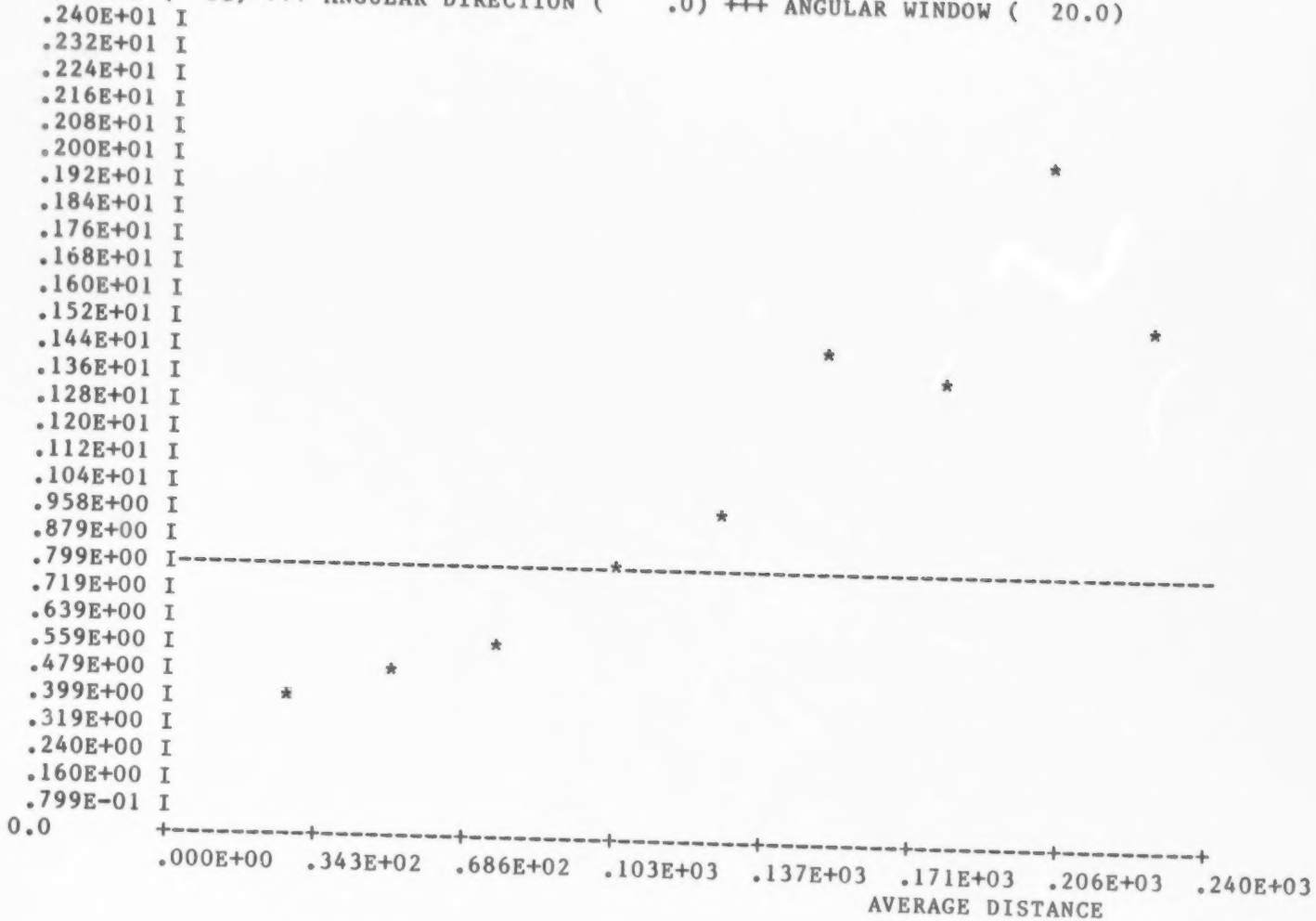
===>	G. R. VAR	L.+R.+VAR	PAIRS	DIST	LOG. VAR
	.00000E+00	.00000E+00	0	.00	.00000E+00
	.33573E+00	.27416E+00	228	25.02	.49855E+00
	.46971E+00	.35011E+00	190	50.05	.53971E+00
	.54416E+00	.41370E+00	151	75.06	.65922E+00
===>	.76887E+00	.51165E+00	119	100.08	.94805E+00
	.95720E+00	.54138E+00	84	125.08	.96264E+00
	.13649E+01	.66326E+00	49	150.07	.13672E+01
	.13224E+01	.68176E+00	29	175.08	.16455E+01
	.19722E+01	.78435E+00	15	200.09	.19710E+01
===>	.14526E+01	.10016E+01	5	225.09	.23224E+01

VARIANCE	=	.14913E+00
GENERAL REL. VAR.	=	.79865E+00
LOCAL REL. VAR.	=	.42173E+00
LOGARITHMIC VARIANCE	=	.10767E+01

*** TEST DEPOSIT - PROGRAM VARIO3 - VERTICAL VARIOGRAM ***

GENERAL RELATIVE VARIOGRAM

VARIABLE (Cu) +++ ANGULAR DIRECTION (.0) +++ ANGULAR WINDOW (20.0)



NORMAL END OF PROGRAM

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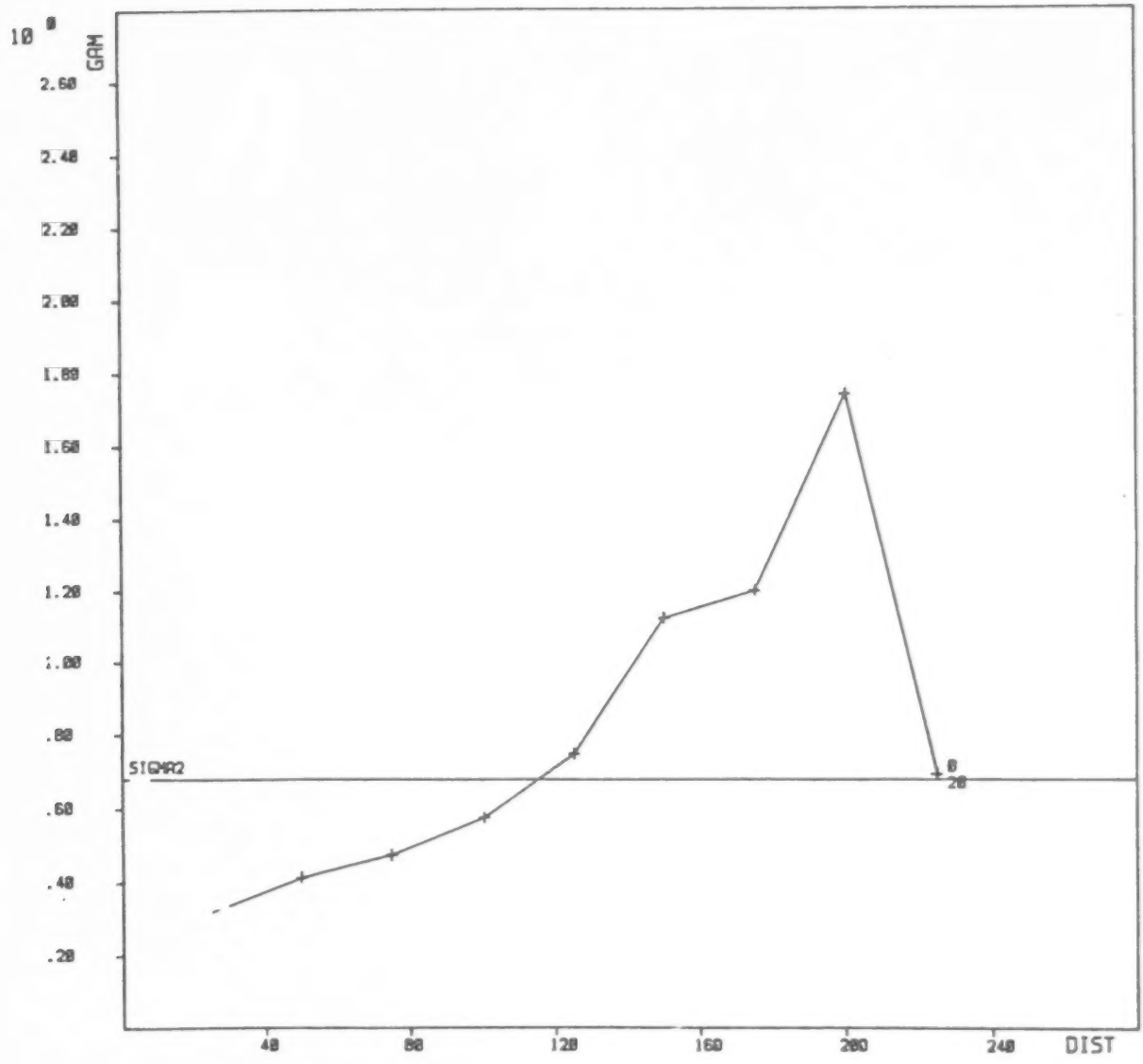
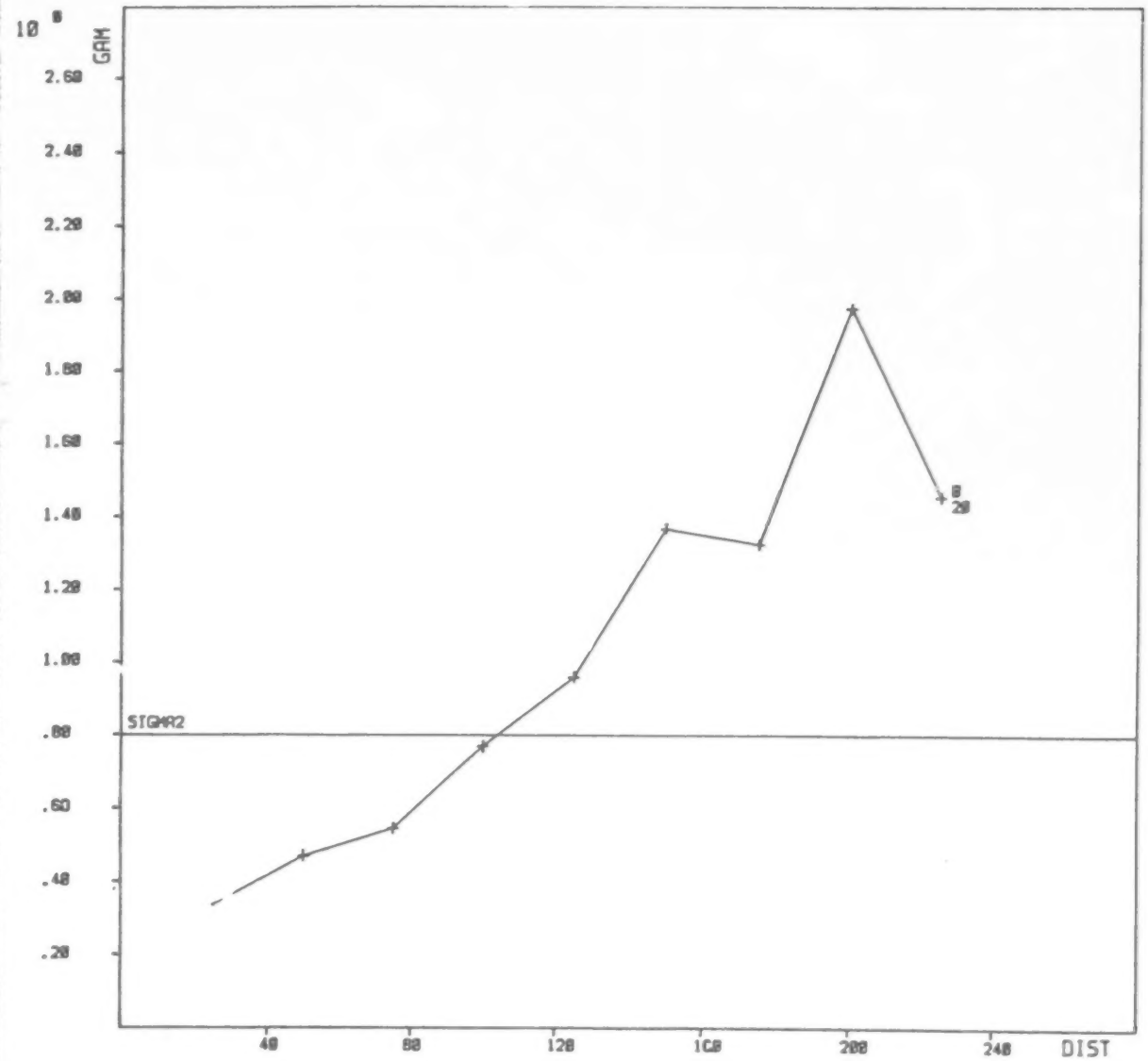
6) PLOTTER OUTPUT OF TEST RUN #2 : (file DRIVER.PLT)



VARIABLE N1 GENERAL RELATIVE VARIOGRAM

*** TEST DEPOSIT - PROGRAM VARIO3 - VERTICAL VARIOGRAMS ***



VARIABLE Cu GENERAL RELATIVE VARIOGRAM

*** TEST DEPOSIT - PROGRAM 'VARIO3 - VERTICAL VARIOGRAMS ***

PROGRAM BLAST

Program description

INTRODUCTION

BLAST is a program used to discretize a given volume defined by a digitized contour. The contour is defined in 2D, the third dimension being the height of the volume.

DEFINITION OF THE VOLUME

The volume is defined by a digitized contour created by the program DIGIT, the height of the volume and the base elevation of the volume (or blast).

The contour is stored in a file by DIGIT. The height and elevation of the blast are prompted at execution time.

DEFINITION OF THE DISCRETIZATION GRID

The volume (or blast) is numerically defined by discrete points evenly distributed inside the volume. The grid is then defined by three parameters: the number of points to generate along the X, Y and Z directions.

HOW TO RUN THE PROGRAM

Invoke the program by typing its name:

BLAST «RETURN»

The program prompts you for the file containing the digitized contour of the blast:

ENTER BLAST PERIMETER FILE:

Then the program prompts you for the file containing the discretized points forming the volume:

ENTER DIGITIZED BLAST FILE:

Then for the blast elevation and thickness

ENTER BLAST ELEVATION AND THICKNESS:

Then for the discretization parameter in X, Y and Z directions:

ENTER DISCRETIZATION PARAMETERS:

At this point the program executes and produces a file (the digitized blast file) containing the discretized points generated. The program also displays the blast surface and volume and the number of discretized points written to the file.

PROGRAM UNFOLD

Program description

INTRODUCTION

UNFOLD is a program used to compute stratigraphic coordinates of points. It is specially used to «unfold» folded strata. It computes the coordinates along the layers and across the layers. UNFOLD is used when the cartesian coordinates are unuseable due to folding of strata. It is used prior to computing variograms or kriging for example.

DEFINITION OF GEOLOGY OR STRATIGRAPHY

The area of interest, which contains the points to unfold should have defined geology. Usually the geology is already interpreted on section plans. The geology information is then stored in a computer file using program DIGIT.

THE INPUT DATA FILE

This file contains the data to be unfolded. It must contain a hole ID, X, Y and Z coordinates and grade values.

THE PROGRAM CONTROL PARAMETERS

The program control parameters are stored in a file that is read by the program at run time. The information in this file is stored in a specific format.

The first line contains the title of the job. This is used for information purposes only.

The second line contains a debug option and the number of layers that are present in the geology model (max. 11).

The fourth line contains the layers code names. Three characters symbols are used.

The fifth line contains the information about the sections stored in the geology model: the first section number, the last section number to analyze, the section coordinate of section # 1 and the interval between the sections.

The sixth line contains the number of grade values to read on each data card.

Finally, the seventh line contains the FORTRAN format of input data cards.

Here is an example of control parameter file:

Line		
1	TEST	Text maximum 80 characters
2	0	Debug option (0=no debug message printed)
3	9	Number of layers present in the geology model
4	A01A02A03A04A05A06A07A08A09	Layers code names for the 9 layers
5	1 4 3600 150	Sections 1 to 4 are analyzed. Section 1 coordinate is 3600 the interval between the section is 150. This means we are looking at sections 3600, 3750, 3900, 4050
6	3	Three grade values are read on input. What is read is the a hole ID, 3 coordinates and 3 grade values
7	(A10,3F10.0,3F10.0)	Format to read the data A10 means that the hole ID is alphanumeric and is 10 characters long 3F10.0 means that the three coordinates are floating point numbers each occupying a field of 10 characters.

THE OUTPUT DATA FILE

The program outputs a file containing for each sample: the Hole ID, the X,Y,Z coordinates, the unfolded stratigraphic coordinates and the grade value(s).

HOW TO RUN THE PROGRAM

First, invoke the program by typing:

UNFOLD

The program will prompt you for the printer output file:

ENTER PRINTER OUTPUT FILE

The user specifies where the program's printer output will go, either to the screen, line printer or a file on disk.

Then the program prompts for the control file name:

ENTER CTRL PARAMETERS FILE

The user specifies the file containing the control parameters to use.

Then the program prompts for the file containing the digitized sections of the geology model:

ENTER DIGIT. SECTIONS FILE

The user is prompted for the file containing the samples on which we want to compute the stratigraphic coordinates:

ENTER SAMPLES FILE

Finally, the program prompts the user for the output data file which will contain the samples with their unfolded coordinates.

At this point the program executes and produces the file containing the samples with unfolded coordinates.

PROGRAM KRIBLAST

Program description

INTRODUCTION

Program KRIBLAST is a kriging program specially designed for the kriging of blasts of any shape. It can also estimate two different variables at a time.

The program processes one blast at a time. The blast volume is defined by its set of discretized points generated by the program BLAST. The zone of influence within which the samples will be used in kriging is defined by a halo of constant thickness around the blast's shape.

DEFINITION OF THE BLAST

The blast volume is defined by a number of discrete points regularly spaced within the volume. Program BLAST was written specially for the purpose of discretizing a volume. Please refer to the user manual of BLAST for more information.

THE PROGRAM CONTROL PARAMETERS

The first parameter to enter is a title, used only for information purposes. This is the first line of the control file. Secondly, a debug option is available that when set, points detailed information about the execution of the program. The user also specifies

the number of variables to be estimated (up to 2), the rock type or layer type code and the search distance. In cases where more than one rock type or layer or seam are present in the block, the program will only estimate the parts of the block that are of the desired layer type. One run for each layer type is required. This is because the variograms probably differ from one layer to the other.

The search distance is in fact the maximum distance between a sample and the contour of the blast that is permitted. Samples too far from the blast are rejected.

This forms the second line of the control file. Next, the user specifies the variogram parameters for each variable. Five variogram components for each variable are allowed. The allowed variogram components are: nugget, spherical or linear.

The last parameters to be entered are minimum and maximum grade values to be considered. The samples having grade values outside those boundaries are discarded.

THE INPUT DATA FILE

The user must supply the samples file organized in the following way:

Each sample must have:

1 - a hole identificator

2 - X,Y,Z coordinates

3 - grade value(s)

The program is acutally organized in such a way that the Y coordinate represents the layer number and the relative position of the sample in the layer. This is the standard output of program UNFOLD. The actual screening of samples according to layer type is done using the Y coordinate.

THE OUTPUT OF THE PROGRAM

The program outputs the estimated grade and estimation variance of the portion of the blast treated. It also gives the proportion of the blast that was estimated.

After running the program for all the layer types contained in the blast, the user must compute the weighted average of the layers estimates in order to get the global grade estimate for the entire blast.

APPENDIX 2

Drill hole data used in this study

1	41-2A	2997.60	-517.55		823.00	180.0	-47.00				
2	41-2A	60.96	180.0		-43.00						
2	41-2A	121.92	180.0		-46.00						
3	41-2A	14.63	18.29	3.66	37.9	37.9	50.4	81.9	16.3	88.1	
3	41-2A	18.29	24.38	6.10	6.3	5.8	5.9	60.9	21.2	62.1	
3	41-2A	32.31	33.53	1.22	37.7	37.1	49.1	80.3	17.5	86.4	
3	41-2A	35.05	35.97	0.91	42.9	42.8	58.9	85.1	13.1	91.1	
3	41-2A	40.84	46.94	6.10	42.1	43.4	57.6	84.8	13.2	90.7	
3	41-2A	46.94	53.04	6.10	44.4	45.2	61.7	86.0	12.3	92.0	
3	41-2A	53.04	59.13	6.10	38.3	38.6	53.1	86.3	11.4	92.0	
3	41-2A	59.13	65.23	6.10	27.6	27.4	37.3	83.9	13.6	89.6	
3	41-2A	65.23	70.41	5.18	42.6	43.1	60.8	88.5	10.6	94.6	
3	41-2A	70.41	77.11	6.71	35.9	35.2	48.6	83.6	15.0	89.9	
3	41-2A	78.33	80.77	2.44	32.6	31.7	43.8	83.3	14.3	89.2	
3	41-2A	83.82	89.92	6.10	33.0	33.4	43.2	81.0	16.2	86.8	
3	41-2A	89.92	96.01	6.10	39.2	39.0	51.7	81.5	15.9	87.5	
3	41-2A	96.01	98.15	2.13	37.8	37.3	49.6	81.1	16.2	87.1	
1	10-02	2997.60	-426.72		818.90	180.0	-50.00				
3	10-02	32.00	38.10	6.10	33.9	34.8	45.6	83.3	14.4	89.2	
3	10-02	38.10	44.20	6.10	33.0	33.3	46.7	87.7	11.1	93.7	
3	10-02	44.20	50.29	6.10	37.0	37.7	52.9	89.0	9.3	94.8	
3	10-02	50.29	56.39	6.10	46.5	46.8	69.4	93.0	6.4	98.9	
1	035-5	2997.60	-338.33		814.40	180.0	-55.00				
2	035-5	60.96	180.0		-48.00						
2	035-5	121.92	180.0		-48.00						
2	035-5	182.88	180.0		-51.00						
2	035-5	243.84	180.0		-47.50						
2	035-5	304.80	180.0		-48.50						
3	035-5	4.27	6.10	1.83	19.5	19.2	24.6	78.7	15.6	83.5	
3	035-5	6.10	12.19	6.10	36.5	36.3	51.2	87.3	10.7	93.0	
3	035-5	12.19	18.29	6.10	32.7	32.5	44.0	83.8	12.7	89.2	
3	035-5	18.29	24.38	6.10	32.0	32.1	41.8	81.0	15.4	86.5	
3	035-5	24.38	30.48	6.10	28.6	28.8	34.8	75.4	19.5	80.8	
3	035-5	53.34	54.86	1.52	31.4	31.6	37.5	72.9	24.0	79.2	
3	035-5	54.86	58.22	3.35	33.6	32.7	40.2	73.1	23.6	79.4	
3	035-5	62.48	66.14	3.66	24.9	24.8	31.1	77.5	17.5	82.7	
3	035-5	89.92	91.44	1.52	31.2	32.1	44.2	88.1	9.9	93.8	
3	035-5	91.44	97.54	6.10	19.5	20.4	26.5	85.3	10.4	90.4	
3	035-5	97.54	103.63	6.10	17.9	18.5	23.5	81.6	14.6	87.0	
3	035-5	103.63	109.73	6.10	35.5	35.7	51.2	89.5	9.4	95.5	
3	035-5	109.73	115.82	6.10	46.7	47.1	68.0	90.5	8.8	96.5	
3	035-5	115.82	121.92	6.10	57.2	57.7	84.5	91.8	7.9	97.9	
3	035-5	128.02	134.11	6.10	62.4	62.3	91.2	90.6	9.1	96.9	
3	035-5	134.11	140.21	6.10	49.7	50.1	72.8	91.1	8.1	97.1	
3	035-5	140.21	146.30	6.10	36.9	37.7	51.0	85.6	12.5	91.5	
3	035-5	146.30	152.40	6.10	34.8	35.1	48.2	86.0	12.2	91.9	
3	035-5	152.40	158.50	6.10	39.3	39.9	55.4	87.4	11.2	93.4	
3	035-5	158.50	164.59	6.10	42.6	43.0	61.0	89.0	9.8	95.0	
3	035-5	164.59	170.69	6.10	40.4	40.9	55.0	84.5	12.8	90.2	
3	035-5	170.69	176.78	6.10	40.3	40.3	57.6	89.2	8.6	94.7	

3	035-5	176.78	182.88	6.10	39.7	39.5	52.9	82.3	15.1	88.2
3	035-5	182.88	188.98	6.10	36.7	36.9	48.8	82.7	13.7	88.2
3	035-5	188.98	195.07	6.10	33.1	33.4	41.6	78.0	17.6	83.4
3	035-5	195.07	201.17	6.10	39.3	39.8	55.0	87.1	10.3	92.6
3	035-5	201.17	207.26	6.10	31.5	32.1	43.2	85.1	12.5	90.9
3	035-5	207.26	213.36	6.10	46.8	47.4	68.9	91.7	7.2	97.6
3	035-5	213.36	219.46	6.10	31.0	31.5	42.1	84.3	12.8	89.9
3	035-5	219.46	225.55	6.10	26.2	26.2	34.5	81.9	14.0	87.2
3	035-5	231.65	237.74	6.10	32.6	32.8	43.0	81.9	15.0	87.6
3	035-5	237.74	243.84	6.10	28.3	28.3	37.1	81.6	14.8	87.1
3	035-5	243.84	249.94	6.10	32.3	33.1	43.4	83.7	13.2	89.2
3	035-5	249.94	256.03	6.10	34.3	34.8	45.1	81.4	15.3	87.0
3	035-5	256.03	262.13	6.10	31.9	32.4	43.6	85.0	12.4	90.7
1	10-03	2997.60	-259.08	780.89		180.0	-51.00			
2	10-03	60.96	180.0	-52.00						
2	10-03	121.92	180.0	-52.00						
2	10-03	182.88	180.0	-56.00						
3	10-03	3.35	9.45	6.10	22.4	21.8	27.2	74.7	20.8	80.3
3	10-03	9.45	15.54	6.10	19.7	18.6	25.0	79.4	14.5	84.1
3	10-03	15.54	21.64	6.10	23.5	22.6	29.7	79.1	15.5	84.1
3	10-03	21.64	27.74	6.10	16.2	16.4	17.7	68.7	21.1	72.5
3	10-03	27.74	33.83	6.10	24.8	23.1	28.8	72.5	19.8	77.0
3	10-03	33.83	39.93	6.10	29.9	29.9	42.2	88.2	9.3	93.7
3	10-03	39.93	46.02	6.10	30.1	27.1	40.2	83.2	13.0	88.6
3	10-03	46.02	52.12	6.10	30.5	32.2	40.4	82.5	13.7	87.9
3	10-03	57.91	62.48	4.57	28.4	26.1	38.0	83.5	12.0	88.5
3	10-03	76.20	82.30	6.10	32.0	31.0	42.8	83.3	13.4	88.8
3	10-03	82.30	88.39	6.10	26.4	27.3	34.6	81.1	15.7	86.9
3	10-03	88.39	94.49	6.10	24.8	23.7	32.8	82.0	15.1	87.8
3	10-03	94.49	100.58	6.10	35.9	37.6	49.0	84.7	13.1	90.5
3	10-03	100.58	106.68	6.10	46.4	45.3	65.3	87.3	11.4	93.3
3	10-03	106.68	112.78	6.10	46.1	46.2	65.3	87.9	10.6	93.8
3	10-03	112.78	118.87	6.10	37.5	38.9	51.0	84.6	12.9	90.3
3	10-03	118.87	124.97	6.10	41.0	40.8	54.5	82.2	15.7	88.2
3	10-03	124.97	128.32	3.35	29.4	28.9	38.6	82.0	13.6	87.2
3	10-03	155.14	156.67	1.52	43.2	44.4	61.9	89.1	9.7	95.0
1	10-04	2997.60	-167.64	758.71		180.0	-60.00			
2	10-04	60.96	180.0	-59.00						
2	10-04	121.92	180.0	-59.00						
2	10-04	176.78	180.0	-59.00						
3	10-04	28.35	34.44	6.10	22.4	21.9	28.4	78.9	16.2	84.1
3	10-04	34.44	40.54	6.10	18.4	20.4	22.0	74.7	18.1	79.2
3	10-04	40.54	46.63	6.10	25.9	26.8	32.6	78.9	14.8	83.6
3	10-04	46.63	52.73	6.10	19.9	19.3	23.0	71.8	21.3	76.7
3	10-04	52.73	58.83	6.10	18.8	19.6	21.3	70.3	22.2	75.0
3	10-04	58.83	64.92	6.10	20.9	22.2	26.0	76.8	19.1	82.4
3	10-04	64.92	71.02	6.10	21.6	21.6	27.1	77.6	18.4	83.2
3	10-04	71.02	77.11	6.10	21.2	21.2	24.7	71.7	22.7	77.1
3	10-04	84.43	89.31	4.88	34.9	34.9	47.2	83.6	14.6	89.7
3	10-04	89.31	94.49	5.18	28.9	28.9	39.4	84.4	13.4	90.3

3	10-04	136.55	141.12	4.57	28.9	27.6	37.7	80.8	15.7	86.5
3	10-04	160.93	167.03	6.10	33.9	32.9	45.7	83.7	13.4	89.4
3	10-04	167.03	171.30	4.27	35.8	34.3	48.3	83.6	13.5	89.3
1	045-3	2997.60	-91.44	739.14		180.0	-70.00			
2	045-3	53.34	180.0	-66.00						
2	045-3	114.30	180.0	-66.00						
2	045-3	175.26	180.0	-66.00						
2	045-3	236.22	180.0	-60.00						
2	045-3	297.18	180.0	-57.00						
2	045-3	358.14	180.0	-59.00						
3	045-3	71.63	74.68	3.05	27.6	27.8	36.2	81.7	14.1	87.0
3	045-3	74.68	77.72	3.05	26.3	25.9	34.1	80.9	14.5	86.1
3	045-3	77.72	80.77	3.05	6.5	6.6	5.6	54.9	27.3	56.6
3	045-3	80.77	83.82	3.05	21.9	21.6	27.0	76.6	17.9	81.7
3	045-3	83.82	87.17	3.35	22.6	22.2	27.7	76.5	17.3	81.3
3	045-3	87.17	89.92	2.74	18.5	19.2	21.5	72.0	21.5	77.1
3	045-3	92.96	96.01	3.05	6.0	5.7	4.6	48.6	33.3	50.6
3	045-3	96.01	99.06	3.05	22.8	23.4	28.0	76.3	17.9	81.3
3	045-3	99.06	102.11	3.05	22.8	22.5	26.6	72.0	22.2	77.3
3	045-3	102.11	105.16	3.05	24.0	24.5	31.5	81.3	15.3	87.0
3	045-3	105.16	108.20	3.05	18.4	18.4	23.8	80.7	14.3	85.7
3	045-3	108.20	111.25	3.05	23.4	24.3	29.6	79.0	15.2	83.8
3	045-3	111.25	114.30	3.05	23.1	23.2	30.4	81.7	14.4	87.1
3	045-3	114.30	117.35	3.05	20.3	21.1	25.3	78.2	15.0	82.7
3	045-3	117.35	120.40	3.05	18.0	17.7	21.4	74.8	17.6	79.2
3	045-3	120.40	123.44	3.05	19.2	19.0	23.1	75.1	18.6	80.0
3	045-3	123.44	126.49	3.05	22.2	22.8	27.7	78.1	15.5	82.7
3	045-3	126.49	129.54	3.05	23.6	22.3	31.4	83.6	10.9	88.3
3	045-3	129.54	132.59	3.05	29.3	29.2	38.3	81.2	15.3	86.8
3	045-3	132.59	135.64	3.05	18.1	18.4	22.4	76.8	17.5	81.9
3	045-3	135.64	138.68	3.05	23.3	23.2	30.0	80.4	14.1	85.3
3	045-3	138.68	141.73	3.05	18.3	18.4	22.9	78.9	12.9	82.8
3	045-3	141.73	144.78	3.05	12.0	12.3	12.2	65.1	20.8	67.6
3	045-3	144.78	147.83	3.05	15.7	16.0	17.9	71.5	20.0	75.7
3	045-3	147.83	150.88	3.05	23.7	23.4	29.7	78.3	15.6	83.1
3	045-3	150.88	153.92	3.05	18.8	18.9	23.7	78.5	15.8	83.5
3	045-3	153.92	156.97	3.05	13.1	14.1	15.6	74.4	17.5	78.7
3	045-3	156.97	160.02	3.05	26.6	26.5	35.6	84.0	11.0	88.8
3	045-3	160.02	163.07	3.05	23.5	23.2	29.7	79.2	14.6	83.9
3	045-3	163.07	166.12	3.05	19.1	19.0	23.0	75.4	17.1	79.7
3	045-3	166.12	169.16	3.05	14.4	13.5	16.5	71.9	18.8	75.8
3	045-3	169.16	175.26	6.10	15.7	15.7	17.6	70.1	20.5	74.1
3	045-3	175.26	181.36	6.10	20.3	20.5	24.0	73.6	19.8	78.5
3	045-3	181.36	187.45	6.10	18.2	18.1	21.8	75.2	16.8	79.4
3	045-3	187.45	193.55	6.10	14.4	14.4	15.5	67.8	21.0	71.2
3	045-3	193.55	199.64	6.10	14.1	14.2	16.2	72.7	16.7	76.0
3	045-3	199.64	205.74	6.10	27.9	27.3	35.8	79.7	15.5	84.9
3	045-3	205.74	211.84	6.10	22.4	22.8	27.7	77.7	15.6	82.2
3	045-3	211.84	217.93	6.10	27.1	27.5	34.0	78.5	15.7	83.3
3	045-3	217.93	224.03	6.10	32.2	31.3	42.2	81.6	14.4	87.0

3	045-3	224.03	230.12	6.10	23.2	22.8	27.8	75.4	16.2	79.5
3	045-3	230.12	236.22	6.10	18.6	19.2	21.3	72.1	18.1	75.8
3	045-3	236.22	240.79	4.57	19.4	18.5	23.2	75.2	16.4	79.2
3	045-3	257.56	263.65	6.10	19.0	18.9	21.1	69.9	20.1	73.6
3	045-3	263.65	269.75	6.10	26.5	26.0	33.2	78.1	16.4	83.2
3	045-3	269.75	275.84	6.10	26.6	26.4	35.2	82.3	13.9	87.7
3	045-3	275.84	277.37	1.52	11.6	11.7	13.1	72.1	15.5	74.7
3	045-3	301.75	307.85	6.10	33.3	32.9	44.7	83.2	14.3	89.0
3	045-3	307.85	313.94	6.10	42.0	42.2	56.2	82.8	14.5	88.6
3	045-3	313.94	320.04	6.10	38.5	38.5	53.0	86.0	10.6	91.3
3	045-3	320.04	326.14	6.10	41.8	42.2	57.9	86.0	12.0	91.9
3	045-3	326.14	332.23	6.10	45.5	45.2	63.1	85.8	13.1	92.1
3	045-3	332.23	338.33	6.10	43.9	44.3	63.7	90.4	8.0	96.1
3	045-3	338.33	344.42	6.10	38.3	39.2	50.8	82.3	14.6	87.9
3	045-3	344.42	350.52	6.10	38.8	38.0	51.9	82.8	14.5	88.7
1	04-09	2997.60	-21.33	723.93		180.0	-85.00			
2	04-09	60.96	180.0	-87.50						
2	04-09	121.92	180.0	-85.00						
3	04-09	150.27	156.36	6.10	20.2	18.7	24.9	76.7	17.9	81.8
3	04-09	156.36	162.46	6.10	20.3	18.9	24.1	73.4	21.4	78.9
3	04-09	174.65	180.75	6.10	22.9	23.1	28.9	78.2	17.8	83.8
3	04-09	180.75	186.84	6.10	15.3	15.5	17.6	71.5	21.2	76.2
3	04-09	186.84	192.94	6.10	21.0	18.9	25.7	75.7	19.0	81.0
3	04-09	192.94	199.03	6.10	27.0	27.8	34.8	80.0	16.1	85.5
3	04-09	199.03	200.56	1.52	20.0	21.7	23.0	71.8	20.4	76.3
1	24-03	2997.60	218.54	725.42		180.0	-80.00			
2	24-03	60.96	180.0	-73.17						
2	24-03	121.92	180.0	-71.00						
2	24-03	182.88	180.0	-70.00						
2	24-03	243.84	180.0	-63.75						
2	24-03	304.80	180.0	-55.00						
2	24-03	365.76	180.0	-53.00						
2	24-03	426.72	180.0	-53.00						
2	24-03	457.20	180.0	-56.00						
2	24-03	487.68	180.0	-60.00						
2	24-03	518.16	180.0	-60.00						
3	24-03	299.01	305.10	6.10	25.0	25.1	30.3	74.7	21.1	80.5
3	24-03	305.10	311.20	6.10	18.2	18.1	22.4	76.5	17.1	81.3
3	24-03	311.20	316.99	5.79	12.0	12.1	13.4	69.3	22.0	73.6
3	24-03	316.99	323.09	6.10	17.7	17.6	19.1	66.9	25.0	71.6
3	24-03	323.09	329.18	6.10	23.8	23.7	29.0	75.2	19.8	80.6
3	24-03	329.18	335.28	6.10	21.3	21.5	26.3	76.6	18.6	81.9
3	24-03	335.28	341.38	6.10	26.1	26.1	34.2	81.0	15.7	86.6
3	24-03	341.38	347.47	6.10	25.1	25.1	32.6	80.3	16.4	86.1
3	24-03	347.47	353.57	6.10	21.2	21.4	24.7	71.9	22.6	77.4
3	24-03	353.57	359.66	6.10	24.3	24.3	31.2	79.5	16.5	85.1
3	24-03	359.66	365.76	6.10	27.4	26.8	34.1	76.7	19.2	82.3
3	24-03	365.76	371.86	6.10	27.6	27.1	34.8	77.8	18.2	83.4
3	24-03	371.86	377.95	6.10	24.0	23.8	27.6	71.0	22.7	76.1
3	24-03	377.95	384.05	6.10	23.6	23.0	28.4	74.7	19.8	79.9

3	24-03	384.05	390.14	6.10	16.9	16.7	17.9	65.3	25.9	69.9
3	24-03	390.14	396.24	6.10	21.0	20.5	24.7	72.5	22.1	77.9
3	24-03	396.24	402.34	6.10	25.3	24.9	29.6	72.0	22.8	77.6
3	24-03	402.34	404.77	2.44	32.4	32.3	40.5	77.0	19.3	82.8
3	24-03	423.37	429.46	6.10	34.2	34.1	45.6	82.2	16.1	88.5
3	24-03	429.46	435.56	6.10	33.2	33.5	43.8	81.1	17.5	87.5
3	24-03	435.56	436.17	0.61	36.9	36.2	47.7	79.1	19.2	85.6
3	24-03	445.01	451.10	6.10	40.6	40.4	55.2	84.0	14.4	90.1
3	24-03	451.10	457.20	6.10	44.8	44.4	59.8	82.1	16.6	88.4
3	24-03	460.25	460.86	0.61	37.7	37.5	51.7	84.9	13.2	90.9
3	24-03	463.30	464.82	1.52	41.4	42.3	52.9	77.9	20.8	84.6
1	02-12	3073.80	807.72	702.23		180.0	-60.00			
2	02-12	60.96	180.0	-52.50						
2	02-12	112.78	180.0	-54.00						
3	02-12	52.73	58.83	6.10	29.0	29.6	36.3	77.8	16.9	83.0
3	02-12	73.15	79.25	6.10	37.5	38.6	49.5	82.5	12.9	87.6
3	02-12	79.25	85.34	6.10	36.2	37.3	46.8	80.5	14.9	85.7
3	02-12	85.34	91.44	6.10	29.8	31.9	38.4	80.5	14.2	85.4
3	02-12	91.44	97.54	6.10	22.0	24.3	27.3	77.7	15.4	82.2
3	02-12	108.20	112.78	4.57	17.6	18.2	22.7	81.5	11.2	85.5
1	046-1	3150.00	-609.60	832.71		180.0	-55.00			
2	046-1	60.96	180.0	-50.00						
2	046-1	121.92	180.0	-50.00						
3	046-1	3.05	6.10	3.05	12.3	13.5	14.7	74.8	17.0	79.0
3	046-1	6.10	9.14	3.05	21.9	22.0	28.0	79.2	16.7	84.7
3	046-1	9.14	12.19	3.05	22.4	22.8	29.5	81.7	15.2	87.4
3	046-1	12.19	18.29	6.10	30.7	31.0	40.5	81.6	16.0	87.6
3	046-1	18.29	24.38	6.10	25.7	26.8	33.4	80.2	16.9	86.1
3	046-1	24.38	27.43	3.05	29.1	28.1	36.8	77.8	19.3	83.8
3	046-1	27.43	30.48	3.05	26.0	27.1	33.5	79.9	16.4	85.5
3	046-1	30.48	38.10	7.62	36.3	35.9	47.4	80.2	17.8	86.4
3	046-1	38.10	45.72	7.62	13.4	12.5	16.0	74.4	18.8	79.1
3	046-1	45.72	47.24	1.52	9.0	9.0	9.1	63.4	26.0	67.4
1	25-10	3150.00	-548.64	816.25		180.0	-45.00			
3	25-10	7.92	16.15	8.23	34.3	34.1	45.7	82.5	14.6	88.2
3	25-10	16.15	21.64	5.49	15.7	15.4	19.0	75.6	16.8	79.9
3	25-10	21.64	24.08	2.44	37.9	37.6	51.4	84.0	14.1	90.0
3	25-10	31.39	36.58	5.18	54.5	53.8	77.8	88.4	10.7	94.5
3	25-10	36.58	42.67	6.10	39.5	39.7	54.1	84.9	12.8	90.7
3	25-10	42.67	48.77	6.10	45.4	46.1	65.0	89.0	9.7	94.9
3	25-10	48.77	54.86	6.10	37.9	37.1	52.9	86.5	11.7	92.4
3	25-10	54.86	60.96	6.10	41.0	40.2	57.8	87.5	10.9	93.4
3	25-10	60.96	67.06	6.10	41.1	41.2	58.3	88.4	9.8	94.1
3	25-10	67.06	73.15	6.10	37.9	38.4	52.0	84.9	13.4	91.0
3	25-10	73.15	79.25	6.10	35.3	34.7	48.1	84.3	13.9	90.4
3	25-10	79.25	86.87	7.62	33.0	33.1	43.2	80.8	16.7	86.8
1	10-06	3150.00	-457.20	805.58		180.0	-90.00			
2	10-06	60.96	180.0	-86.00						
2	10-06	121.92	180.0	-84.00						
2	10-06	182.88	180.0	-85.00						

2	10-06	237.74	180.0	-80.00						
3	10-06	11.28	17.37	6.10	35.4	35.7	48.4	85.0	12.8	90.8
3	10-06	17.37	23.47	6.10	29.5	27.8	36.3	76.0	20.1	81.7
3	10-06	23.47	29.26	5.79	35.1	35.1	48.3	85.5	12.1	91.2
3	10-06	62.18	65.84	3.66	19.6	19.4	23.2	74.4	17.3	78.5
3	10-06	74.98	77.11	2.13	24.7	25.5	31.7	79.0	18.3	85.0
3	10-06	77.11	80.77	3.66	24.1	24.4	30.9	79.5	16.2	84.9
3	10-06	94.49	100.58	6.10	37.7	38.4	51.7	85.2	12.4	91.0
3	10-06	100.58	107.29	6.71	42.3	41.6	59.0	87.0	10.0	92.4
3	10-06	107.90	114.00	6.10	42.4	41.6	56.4	82.2	15.5	88.2
3	10-06	114.00	120.09	6.10	34.6	35.7	45.4	81.6	14.9	87.1
3	10-06	120.09	125.27	5.18	35.8	35.7	46.4	80.3	16.4	86.0
3	10-06	126.80	132.89	6.10	43.4	43.2	58.3	83.0	14.8	89.0
3	10-06	132.89	138.99	6.10	35.7	35.7	47.3	82.1	14.5	87.7
3	10-06	138.99	145.08	6.10	34.6	32.8	45.3	81.4	14.7	86.8
3	10-06	145.08	151.18	6.10	34.9	33.6	45.2	80.4	16.0	85.9
3	10-06	151.18	157.28	6.10	34.7	32.5	43.2	76.8	19.1	82.4
3	10-06	157.28	163.37	6.10	47.6	45.8	65.9	85.7	12.8	91.7
3	10-06	163.37	169.47	6.10	33.0	31.0	42.1	79.2	16.8	84.7
3	10-06	169.47	175.56	6.10	28.9	29.2	36.8	79.0	16.7	84.5
3	10-06	175.56	182.88	7.32	32.3	32.0	41.4	79.2	17.1	84.9
3	10-06	182.88	188.98	6.10	38.4	37.3	51.8	83.9	12.8	89.3
3	10-06	188.98	195.07	6.10	47.5	47.8	64.9	84.6	13.5	90.6
3	10-06	195.07	201.17	6.10	34.1	32.1	42.8	77.4	18.9	83.2
3	10-06	205.44	210.31	4.88	39.0	38.9	50.8	80.8	15.5	86.4
3	10-06	216.41	220.98	4.57	32.2	32.0	43.6	84.7	11.6	89.9
1	07-06	3150.00	-121.92	728.56		0.0	-89.00			
2	07-06	60.96	0.0	-90.00						
2	07-06	121.92	0.0	-87.00						
2	07-06	182.88	0.0	-90.00						
3	07-06	30.48	36.58	6.10	26.7	26.8	33.1	77.9	15.4	82.4
3	07-06	48.77	54.86	6.10	16.6	17.0	18.9	70.7	21.0	75.2
3	07-06	79.25	85.34	6.10	5.4	16.2	3.6	46.4	25.2	44.5
3	07-06	85.34	91.44	6.10	15.0	23.0	16.0	67.2	21.8	70.8
3	07-06	91.44	97.54	6.10	20.6	11.9	24.9	75.6	17.4	80.2
3	07-06	103.63	109.73	6.10	16.4	18.0	19.2	73.1	18.8	77.4
3	07-06	109.73	115.82	6.10	30.4	31.6	40.0	81.8	14.5	87.3
3	07-06	115.82	121.92	6.10	21.9	23.1	27.0	77.0	16.9	81.8
3	07-06	121.92	128.02	6.10	29.0	30.0	38.0	81.5	14.8	87.0
3	07-06	128.02	134.11	6.10	23.5	24.7	29.1	77.1	17.3	82.1
3	07-06	134.11	140.21	6.10	21.7	21.7	25.7	73.8	19.6	78.6
3	07-06	140.21	146.30	6.10	29.1	31.7	38.3	81.8	14.4	87.2
3	07-06	146.30	152.40	6.10	19.2	19.3	21.8	71.3	19.3	75.2
3	07-06	152.40	158.50	6.10	25.9	27.6	31.7	76.2	18.4	81.4
3	07-06	158.50	164.59	6.10	26.8	28.0	33.6	78.0	17.4	83.4
3	07-06	164.59	170.69	6.10	21.7	23.4	25.9	73.7	20.3	78.9
3	07-06	170.69	176.78	6.10	23.8	28.0	28.6	74.3	20.5	79.7
3	07-06	176.78	182.88	6.10	16.6	16.5	18.8	70.4	22.4	75.3
3	07-06	182.88	188.98	6.10	11.6	16.0	13.1	70.3	20.9	74.5
3	07-06	222.81	228.60	5.79	22.6	23.4	26.2	71.6	22.6	76.9

3	07-06	228.60	234.70	6.10	25.3	27.1	30.4	73.8	22.1	79.7
3	07-06	234.70	237.13	2.44	22.1	0.0	22.2	60.6	33.6	66.7
1	27-10	3150.00	331.56	729.50		180.0	-65.00			
2	27-10	60.96	180.0	-57.50						
2	27-10	121.92	180.0	-49.00						
2	27-10	182.88	180.0	-47.00						
2	27-10	243.84	180.0	-49.00						
2	27-10	304.80	180.0	-47.00						
2	27-10	365.76	180.0	-46.00						
2	27-10	426.72	180.0	-53.00						
2	27-10	487.68	180.0	-65.00						
3	27-10	10.97	11.89	0.91	21.2	21.5	21.7	63.1	27.8	67.8
3	27-10	11.89	14.33	2.44	15.4	13.9	16.0	63.9	28.3	68.9
3	27-10	14.33	18.29	3.96	23.0	23.9	27.1	74.0	18.2	78.4
3	27-10	18.29	24.38	6.10	15.5	15.4	17.4	70.6	19.9	74.6
3	27-10	24.38	30.78	6.40	19.4	19.9	23.1	74.7	17.1	78.9
3	27-10	30.78	35.97	5.18	13.7	12.5	14.6	65.8	26.5	70.8
3	27-10	35.97	40.54	4.57	22.0	22.4	26.5	75.0	18.2	79.8
3	27-10	287.73	293.52	5.79	22.0	21.6	26.8	76.0	16.9	80.5
3	27-10	302.36	310.90	8.53	25.5	25.1	32.1	78.6	15.7	83.5
3	27-10	310.90	316.99	6.10	24.9	25.1	30.7	76.7	17.1	81.5
3	27-10	316.99	323.09	6.10	21.9	21.8	26.8	76.7	15.9	81.0
3	27-10	323.09	329.18	6.10	22.5	22.2	28.2	78.6	14.9	83.1
3	27-10	329.18	335.28	6.10	22.2	22.2	28.6	81.1	12.9	85.7
3	27-10	335.28	340.16	4.88	22.9	23.0	29.7	81.0	13.5	85.8
3	27-10	348.69	353.57	4.88	17.3	17.1	19.9	72.6	18.4	76.6
3	27-10	359.66	365.76	6.10	18.0	17.8	22.4	77.2	17.2	82.3
3	27-10	365.76	371.86	6.10	15.6	15.6	18.1	73.0	17.6	76.7
3	27-10	371.86	377.95	6.10	15.5	16.0	17.5	71.0	18.9	74.6
3	27-10	377.95	385.27	7.32	21.1	20.2	26.6	79.1	14.0	83.5
3	27-10	388.01	393.19	5.18	19.4	19.5	23.4	75.4	18.0	80.2
3	27-10	393.19	400.20	7.01	22.4	22.8	27.7	76.9	17.5	82.0
3	27-10	400.20	405.38	5.18	23.0	23.0	26.9	72.8	20.3	77.6
3	27-10	405.38	412.09	6.71	27.7	26.7	34.6	78.2	15.7	83.0
3	27-10	432.21	438.91	6.71	34.1	33.5	45.8	83.5	13.4	89.1
3	27-10	438.91	445.01	6.10	33.1	33.0	44.4	83.5	13.2	89.0
3	27-10	445.01	451.10	6.10	37.7	37.8	50.5	83.4	13.5	88.9
3	27-10	451.10	457.20	6.10	39.8	39.3	53.3	83.2	13.7	88.8
3	27-10	457.20	463.30	6.10	39.9	39.1	56.7	88.4	9.7	94.1
3	27-10	484.63	490.73	6.10	44.8	45.2	64.0	89.1	9.3	94.8
3	27-10	490.73	493.78	3.05	37.0	37.9	51.1	85.9	11.3	91.5
3	27-10	499.87	505.97	6.10	56.1	56.6	83.4	92.8	6.4	98.6
3	27-10	505.97	512.06	6.10	57.2	56.7	85.9	93.6	5.8	99.5
3	27-10	512.06	522.73	10.67	46.9	47.1	67.1	89.1	8.9	94.7
3	27-10	522.73	530.35	7.62	42.6	42.9	60.6	88.8	8.8	94.3
3	27-10	530.35	536.45	6.10	48.1	47.5	70.0	90.9	7.6	96.6
1	03-14	3150.00	396.00	734.50		180.0	-49.00			
3	03-14	19.81	27.74	7.92	35.8	37.2	46.5	80.8	15.2	86.2
3	03-14	32.00	38.10	6.10	26.3	27.8	29.9	69.6	24.8	75.2
3	03-14	38.10	45.72	7.62	28.6	30.5	35.0	75.7	19.4	81.2

3	03-14	51.82	59.44	7.62	32.9	34.7	42.2	79.8	15.8	85.1
3	03-14	83.82	89.92	6.10	17.0	18.6	17.5	64.2	25.9	68.3
3	03-14	97.54	105.16	7.62	22.9	24.2	26.7	72.9	19.7	77.5
1	02-11	3150.00	579.12	722.32		180.0	-45.00			
2	02-11	60.96	180.0	-45.00						
2	02-11	121.92	180.0	-43.50						
3	02-11	34.44	40.54	6.10	36.8	37.7	47.9	81.6	12.9	86.3
3	02-11	40.54	46.63	6.10	36.6	37.5	48.8	82.9	13.8	88.5
3	02-11	46.63	52.73	6.10	37.4	37.8	48.1	80.0	15.5	85.3
3	02-11	52.73	60.96	8.23	25.9	25.6	31.6	76.5	16.4	81.0
3	02-11	60.96	67.06	6.10	27.0	27.4	33.8	78.0	16.6	83.1
3	02-11	67.06	73.15	6.10	22.7	23.9	26.9	74.4	17.9	78.8
3	02-11	73.15	79.25	6.10	35.2	35.4	46.6	82.3	14.0	87.8
3	02-11	79.25	85.34	6.10	21.7	22.5	26.6	76.9	16.4	81.5
3	02-11	85.34	91.44	6.10	21.4	22.1	26.8	78.5	15.3	83.2
3	02-11	91.44	97.54	6.10	38.5	39.0	50.4	81.1	15.4	86.7
3	02-11	97.54	103.63	6.10	38.6	39.3	51.3	82.5	14.4	88.2
3	02-11	103.63	109.73	6.10	22.0	20.9	29.0	82.4	12.9	87.4
3	02-11	109.73	114.91	5.18	7.7	3.9	8.9	72.2	21.0	77.1
3	02-11	120.09	126.19	6.10	41.8	44.4	58.2	86.2	12.2	92.2
3	02-11	126.19	132.28	6.10	33.1	34.4	46.9	88.2	9.9	93.9
3	02-11	132.28	138.38	6.10	36.5	37.5	48.2	81.7	15.5	87.6
3	02-11	138.38	143.26	4.88	39.4	41.6	52.1	81.5	16.2	87.6
1	28-01	3150.00	731.52	703.48		180.0	-60.00			
2	28-01	60.96	180.0	-59.50						
2	28-01	121.92	180.0	-58.50						
2	28-01	182.88	180.0	-56.75						
2	28-01	243.84	180.0	-52.00						
2	28-01	304.80	180.0	-53.00						
2	28-01	365.76	180.0	-49.50						
2	28-01	426.72	180.0	-51.00						
2	28-01	487.68	180.0	-46.00						
2	28-01	518.16	180.0	-44.00						
2	28-01	548.64	180.0	-44.00						
2	28-01	609.60	180.0	-44.00						
2	28-01	670.56	180.0	-46.50						
2	28-01	701.04	180.0	-49.00						
2	28-01	731.52	180.0	-55.73						
2	28-01	739.44	180.0	-55.00						
3	28-01	30.48	36.58	6.10	29.4	29.3	33.9	70.5	25.3	76.5
3	28-01	36.58	42.98	6.40	27.8	27.3	32.9	72.5	23.4	78.5
3	28-01	46.94	49.99	3.05	24.3	23.4	25.8	65.1	27.4	70.3
3	28-01	49.99	55.78	5.79	32.5	32.0	42.6	81.0	16.4	86.9
3	28-01	60.35	66.45	6.10	31.3	30.7	39.1	77.2	19.3	83.0
3	28-01	66.45	72.54	6.10	37.4	37.0	48.5	79.9	17.6	86.0
3	28-01	72.54	78.64	6.10	28.9	28.6	34.9	74.7	20.7	80.3
3	28-01	78.64	84.73	6.10	26.7	26.7	31.5	72.5	22.6	78.1
3	28-01	84.73	90.83	6.10	18.8	18.6	23.6	77.7	18.3	83.3
3	28-01	90.83	96.93	6.10	20.9	20.5	25.3	74.8	20.2	80.2
3	28-01	96.93	103.02	6.10	29.9	29.7	37.5	77.1	19.4	83.0

3	28-01	103.02	109.12	6.10	37.5	36.8	47.8	78.2	19.4	84.5
3	28-01	109.12	115.21	6.10	32.6	34.1	40.8	76.8	20.1	82.9
3	28-01	115.21	121.31	6.10	33.9	33.6	41.1	74.3	21.8	80.2
3	28-01	121.31	125.58	4.27	33.6	33.8	40.8	74.5	21.7	80.4
3	28-01	125.58	131.67	6.10	31.5	31.4	37.4	72.6	23.8	78.8
3	28-01	131.67	137.77	6.10	37.4	37.4	48.1	78.9	19.1	85.2
3	28-01	137.77	143.87	6.10	36.9	36.2	45.5	75.4	21.7	81.6
3	28-01	143.87	149.96	6.10	35.3	34.1	43.2	75.2	20.9	81.1
3	28-01	149.96	156.06	6.10	34.7	34.4	40.3	70.9	25.1	76.9
3	28-01	156.06	162.15	6.10	34.4	34.2	41.2	73.6	22.6	79.5
3	28-01	162.15	168.25	6.10	33.9	32.9	42.0	76.3	19.7	82.0
3	28-01	168.25	174.35	6.10	32.6	32.2	39.8	74.9	21.6	81.0
3	28-01	174.35	180.44	6.10	34.8	34.7	42.6	74.9	22.0	81.1
3	28-01	180.44	186.54	6.10	27.5	27.0	31.5	69.7	25.9	75.8
3	28-01	186.54	192.63	6.10	30.6	30.2	36.8	73.9	22.2	79.9
3	28-01	192.63	195.68	3.05	33.2	32.9	42.3	78.2	19.2	84.4
3	28-01	237.44	243.54	6.10	18.2	17.5	21.5	72.4	23.1	78.2
3	28-01	243.54	249.33	5.79	34.0	33.5	41.1	73.7	23.8	80.2
3	28-01	249.33	255.42	6.10	21.3	21.4	24.3	70.7	21.8	75.5
3	28-01	255.42	261.52	6.10	28.7	28.7	34.1	72.7	23.8	78.8
3	28-01	261.52	267.61	6.10	32.1	32.1	37.7	72.0	23.7	77.9
3	28-01	267.61	273.71	6.10	32.5	32.6	38.4	72.6	23.1	78.5
3	28-01	273.71	279.81	6.10	39.4	39.3	49.6	77.6	19.1	83.6
3	28-01	279.81	285.90	6.10	38.7	38.8	49.1	78.3	18.5	84.2
3	28-01	297.18	303.28	6.10	22.5	22.2	25.5	68.6	27.7	74.9
3	28-01	303.28	305.41	2.13	15.9	15.6	17.5	67.7	25.7	73.0
3	28-01	316.38	320.34	3.96	34.1	33.8	43.3	77.8	19.9	84.1
3	28-01	327.05	333.15	6.10	36.7	36.0	43.1	71.6	24.6	77.7
3	28-01	333.15	339.24	6.10	38.9	38.8	48.6	76.7	20.6	82.9
3	28-01	339.24	345.34	6.10	35.5	35.6	43.1	74.7	21.4	80.6
3	28-01	345.34	351.43	6.10	29.8	29.6	35.1	72.0	24.6	78.2
3	28-01	351.43	353.26	1.83	35.0	34.9	42.9	75.1	21.7	81.2
3	28-01	353.26	356.01	2.74	7.7	7.6	5.9	44.0	47.8	50.4
3	28-01	356.01	362.10	6.10	26.0	26.2	31.1	73.7	22.1	79.5
3	28-01	362.10	368.20	6.10	33.0	32.8	37.7	69.6	26.3	75.7
3	28-01	368.20	371.55	3.35	14.8	24.6	17.3	73.2	18.6	77.5
3	28-01	371.55	374.60	3.05	24.6	14.4	21.4	51.0	43.4	57.9
3	28-01	374.60	377.65	3.05	11.4	11.5	11.2	59.5	33.7	65.2
3	28-01	377.65	384.05	6.40	16.1	16.5	16.0	60.9	30.2	65.8
3	28-01	384.05	387.10	3.05	11.4	11.5	11.1	57.7	37.0	64.1
3	28-01	487.07	493.17	6.10	10.1	10.3	9.3	56.4	33.1	60.9
3	28-01	493.17	499.26	6.10	19.6	19.4	20.4	63.6	29.9	69.2
3	28-01	499.26	505.36	6.10	23.6	22.8	26.3	68.2	26.7	74.0
3	28-01	505.36	511.45	6.10	25.6	25.5	27.5	65.0	30.5	71.2
3	28-01	511.45	517.55	6.10	27.8	27.8	30.6	66.8	28.7	73.0
3	28-01	517.55	523.65	6.10	24.2	24.3	25.9	65.0	29.8	71.1
3	28-01	523.65	529.74	6.10	25.6	27.3	25.8	60.8	33.3	66.8
3	28-01	529.74	535.84	6.10	19.1	18.8	17.9	56.1	36.7	61.9
3	28-01	535.84	541.93	6.10	20.6	20.2	20.5	60.7	31.4	66.0
3	28-01	541.93	548.03	6.10	20.5	20.2	20.6	60.1	34.8	66.5

3	28-01	548.03	554.13	6.10	19.3	18.9	19.7	62.0	31.8	67.9
3	28-01	554.13	560.22	6.10	24.1	23.4	24.3	60.9	32.9	66.9
3	28-01	560.22	566.32	6.10	27.4	26.6	31.8	71.1	24.4	77.0
3	28-01	566.32	572.41	6.10	22.5	22.0	26.3	71.7	23.6	77.5
3	28-01	572.41	578.51	6.10	19.3	19.4	20.3	64.1	29.3	69.7
3	28-01	578.51	584.61	6.10	27.2	31.1	37.5	86.3	10.4	91.6
3	28-01	584.61	590.70	6.10	26.1	26.6	32.7	77.3	19.5	83.2
3	28-01	590.70	594.06	3.35	12.1	12.1	12.4	63.3	28.0	68.1
3	28-01	594.06	597.10	3.05	13.8	13.7	15.5	69.1	24.3	74.2
3	28-01	606.86	609.90	3.05	3.6	2.4	2.5	49.2	16.3	44.6
3	28-01	609.90	616.00	6.10	38.3	38.2	52.4	84.6	14.0	90.8
3	28-01	616.00	622.10	6.10	35.7	35.5	46.9	80.7	17.6	87.0
3	28-01	622.10	628.19	6.10	38.3	37.9	49.4	79.2	18.6	85.4
3	28-01	628.19	634.29	6.10	37.3	37.5	47.0	77.2	20.3	83.5
3	28-01	634.29	640.38	6.10	43.9	44.3	60.1	84.4	14.3	90.7
3	28-01	640.38	646.48	6.10	47.2	47.5	65.3	85.3	14.1	91.7
3	28-01	646.48	649.22	2.74	36.7	36.7	46.8	78.3	19.7	84.7
3	28-01	649.22	653.49	4.27	16.1	16.2	14.9	56.7	33.8	61.6
3	28-01	653.49	655.62	2.13	38.3	38.5	50.4	81.0	17.2	87.3
3	28-01	655.62	660.81	5.18	26.0	26.7	32.6	77.1	20.1	83.2
3	28-01	660.81	663.85	3.05	5.5	5.8	4.5	51.3	33.1	54.1
3	28-01	674.83	677.88	3.05	10.1	10.2	7.7	46.8	38.5	50.4
3	28-01	677.88	682.14	4.27	31.7	31.8	39.3	75.7	22.2	82.3
3	28-01	682.14	685.19	3.05	2.0	2.1	.5	26.4	23.1	17.0
3	28-01	707.44	713.54	6.10	34.7	35.0	45.0	80.2	16.7	86.0
3	28-01	713.54	718.72	5.18	32.9	33.4	41.9	78.4	18.7	84.4
1	27-06	3150.00	877.82	686.40	180.0	-62.00				
2	27-06	60.96	180.0	-63.75						
2	27-06	91.44	180.0	-60.00						
2	27-06	121.92	180.0	-54.00						
2	27-06	182.88	180.0	-53.00						
3	27-06	51.51	57.30	5.79	32.0	32.2	43.1	84.0	12.3	89.3
3	27-06	61.57	67.06	5.49	27.4	27.3	34.7	79.0	15.9	84.0
3	27-06	67.06	73.15	6.10	22.5	22.5	27.9	77.3	17.4	82.5
3	27-06	73.15	76.50	3.35	16.6	16.7	19.5	73.4	18.4	77.7
3	27-06	79.86	85.34	5.49	24.2	24.0	30.5	78.8	15.8	83.7
3	27-06	85.34	91.44	6.10	24.4	24.7	30.4	77.8	16.3	82.6
3	27-06	91.44	96.93	5.49	37.2	37.4	48.1	79.8	16.8	85.5
3	27-06	130.15	134.42	4.27	34.0	34.4	44.6	81.7	14.3	87.1
3	27-06	149.66	155.45	5.79	32.3	33.1	41.9	80.4	16.0	86.0
3	27-06	155.45	161.54	6.10	25.7	26.3	33.1	79.8	16.2	85.3
1	24-05	3150.00	1035.28	669.64	180.0	-52.00				
2	24-05	60.96	180.0	-48.00						
2	24-05	121.92	180.0	-47.00						
2	24-05	182.88	180.0	-47.00						
2	24-05	243.84	180.0	-43.00						
2	24-05	304.80	180.0	-39.00						
2	24-05	365.76	180.0	-35.00						
2	24-05	426.72	180.0	-30.00						
2	24-05	487.68	180.0	-33.17						

3	24-05	131.98	138.38	6.40	33.4	33.2	43.6	81.0	15.7	86.7
3	24-05	139.29	140.82	1.52	21.5	20.7	25.7	73.9	20.4	79.1
3	24-05	144.17	152.40	8.23	22.0	22.2	27.7	78.5	16.0	83.5
3	24-05	152.40	158.50	6.10	20.8	21.1	24.7	73.6	19.7	78.5
3	24-05	162.76	167.64	4.88	24.0	24.0	31.2	80.9	14.7	86.2
3	24-05	167.64	173.74	6.10	26.8	27.3	33.5	77.8	16.8	82.9
3	24-05	173.74	179.83	6.10	32.3	32.3	42.2	81.2	14.6	86.5
3	24-05	179.83	182.58	2.74	38.3	36.9	50.5	81.9	14.6	87.5
3	24-05	227.69	233.78	6.10	31.4	30.0	42.1	83.7	12.0	88.8
3	24-05	233.78	239.88	6.10	32.7	32.5	43.3	82.3	13.5	87.6
3	24-05	239.88	242.62	2.74	35.5	35.0	49.7	87.4	9.7	92.7
3	24-05	443.18	449.58	6.40	32.2	31.7	44.0	84.9	12.5	90.6
3	24-05	449.58	455.68	6.10	31.2	31.6	41.5	82.6	13.7	88.0
3	24-05	455.68	461.77	6.10	40.5	40.5	55.1	84.1	13.9	90.1
3	24-05	461.77	467.56	5.79	37.4	37.2	50.2	83.0	15.0	89.1
3	24-05	473.35	479.45	6.10	38.4	38.7	50.5	81.3	16.2	87.2
3	24-05	479.45	485.55	6.10	29.4	29.5	38.1	80.4	15.9	85.9
3	24-05	485.55	491.64	6.10	36.7	36.9	48.0	80.9	16.0	86.7
3	24-05	491.64	497.74	6.10	34.4	34.1	44.4	80.3	15.4	85.6
3	24-05	497.74	502.01	4.27	36.4	36.6	46.8	79.6	16.5	85.2
1	041-1	3302.30	-548.64	800.70		180.0	-53.00			
2	041-1	60.96	180.0	-49.00						
3	041-1	12.50	18.59	6.10	35.0	35.9	45.2	79.8	17.0	85.5
3	041-1	18.59	24.69	6.10	35.4	35.6	44.9	78.4	18.4	84.2
3	041-1	24.69	30.78	6.10	37.2	37.4	48.5	80.6	16.6	86.5
3	041-1	30.78	36.88	6.10	32.9	32.8	43.2	80.9	16.6	86.9
3	041-1	36.88	42.98	6.10	30.0	29.5	38.9	80.0	17.4	86.0
3	041-1	42.98	46.02	3.05	36.0	37.1	49.4	85.2	12.2	90.9
3	041-1	46.02	49.07	3.05	27.8	26.8	34.9	77.4	19.5	83.4
3	041-1	57.00	59.13	2.13	26.0	26.1	34.0	81.1	15.3	86.7
1	035-4	3302.30	-470.92	771.30		180.0	-55.00			
2	035-4	60.96	180.0	-49.00						
2	035-4	121.92	180.0	-54.00						
3	035-4	12.19	18.29	6.10	57.6	57.8	85.0	91.8	7.5	97.8
3	035-4	18.29	24.38	6.10	32.9	33.3	43.6	82.2	14.4	87.7
3	035-4	24.38	30.48	6.10	28.8	29.2	36.3	78.1	17.5	83.6
3	035-4	30.48	36.58	6.10	26.7	27.1	33.2	76.8	18.9	82.3
3	035-4	36.58	38.71	2.13	31.8	32.4	42.1	81.9	15.3	87.7
3	035-4	44.20	47.24	3.05	30.9	31.6	38.9	77.7	18.8	83.5
3	035-4	55.78	60.96	5.18	40.6	41.0	54.2	82.3	16.0	88.5
3	035-4	60.96	67.06	6.10	43.3	39.3	62.2	89.5	8.6	95.1
3	035-4	67.06	73.15	6.10	35.2	36.0	46.1	81.1	15.5	86.7
3	035-4	73.15	79.25	6.10	37.1	37.8	50.4	84.4	13.1	90.1
3	035-4	79.25	85.34	6.10	35.7	36.5	47.2	82.1	14.5	87.6
3	035-4	85.34	91.44	6.10	36.4	36.9	49.2	83.9	13.5	89.6
3	035-4	91.44	97.54	6.10	24.2	25.1	34.3	88.3	9.5	94.0
3	035-4	97.54	103.63	6.10	32.0	32.2	45.1	87.9	9.9	93.6
1	08-04	3302.30	-391.67	780.91		180.0	-80.00			
2	08-04	60.96	180.0	-80.00						
2	08-04	121.92	180.0	-80.00						

2	08-04	182.88	180.0	-80.00						
3	08-04	6.10	12.19	6.10	24.2	25.0	30.5	78.0	17.5	83.5
3	08-04	12.19	18.29	6.10	25.2	25.6	30.2	74.4	19.4	79.4
3	08-04	18.29	24.38	6.10	19.7	20.2	23.1	72.9	20.6	77.9
3	08-04	24.38	30.48	6.10	21.9	22.7	26.9	76.4	17.7	81.4
3	08-04	30.48	36.58	6.10	20.0	20.3	24.3	75.8	17.7	80.6
3	08-04	36.58	42.67	6.10	22.4	22.1	27.6	76.6	18.0	81.7
3	08-04	42.67	45.72	3.05	25.3	26.0	30.8	75.3	19.5	80.6
3	08-04	45.72	48.77	3.05	29.6	29.7	38.1	79.5	16.7	85.1
3	08-04	48.77	53.34	4.57	26.3	25.8	33.7	80.1	14.7	85.1
3	08-04	53.34	59.44	6.10	21.3	20.4	25.9	76.2	16.9	80.8
3	08-04	59.44	65.53	6.10	22.0	19.7	27.7	78.5	15.8	83.4
3	08-04	65.53	71.63	6.10	22.2	18.6	27.2	76.6	16.5	81.2
3	08-04	77.72	83.82	6.10	21.8	21.4	26.1	74.3	20.4	79.6
3	08-04	83.82	89.92	6.10	21.9	20.4	26.1	73.7	21.4	79.3
3	08-04	89.92	96.01	6.10	18.2	17.4	20.9	70.6	24.2	76.2
3	08-04	96.01	102.11	6.10	24.0	21.7	30.1	78.0	17.0	83.2
3	08-04	102.11	108.20	6.10	33.6	32.9	43.7	80.4	16.6	86.3
3	08-04	108.20	114.30	6.10	24.5	23.6	29.0	73.1	21.8	78.6
3	08-04	114.30	120.40	6.10	32.3	32.8	39.1	74.4	21.7	80.3
3	08-04	141.73	144.17	2.44	37.0	36.9	49.0	82.0	15.4	87.9
3	08-04	153.31	158.80	5.49	47.3	45.9	65.9	86.4	12.0	92.4
3	08-04	165.81	171.91	6.10	36.2	34.1	47.4	81.2	15.5	86.9
3	08-04	171.91	178.00	6.10	37.4	38.7	52.4	87.5	9.6	92.9
3	08-04	208.48	211.23	2.74	31.4	29.4	39.8	77.9	19.3	83.9
1	077-2	3300.00	-161.00	726.50		180.0	-64.00			
2	077-2	55.00	180.0	-66.00						
2	077-2	100.00	180.0	-67.00						
2	077-2	150.00	180.0	-66.00						
2	077-2	200.00	180.0	-67.00						
2	077-2	250.00	180.0	-68.00						
2	077-2	300.00	180.0	-67.00						
3	077-2	124.36	131.06	6.71	18.7	18.8	21.3	71.3	20.2	75.6
3	077-2	131.06	137.16	6.10	31.5	31.1	41.5	82.0	14.1	87.4
3	077-2	137.16	143.26	6.10	25.2	24.9	31.2	77.2	16.5	81.9
3	077-2	143.26	149.35	6.10	20.1	20.0	23.4	72.6	19.4	76.9
3	077-2	149.35	155.45	6.10	30.8	31.2	39.4	79.4	16.4	84.8
3	077-2	155.45	161.54	6.10	24.8	25.1	31.1	78.0	16.2	82.9
3	077-2	161.54	167.64	6.10	17.0	16.5	18.8	69.6	21.0	73.6
3	077-2	167.64	173.74	6.10	21.6	21.1	23.7	68.4	23.6	73.0
3	077-2	173.74	179.83	6.10	19.3	18.5	22.5	72.2	21.4	77.2
3	077-2	179.83	185.93	6.10	18.4	18.2	21.8	74.0	19.0	78.7
3	077-2	185.93	192.02	6.10	12.3	12.2	11.9	61.5	24.4	64.2
3	077-2	192.02	198.12	6.10	30.6	30.9	39.4	80.0	15.8	85.4
3	077-2	198.12	204.52	6.40	24.0	23.9	29.6	76.8	17.0	81.6
3	077-2	210.62	216.41	5.79	34.4	34.7	46.1	83.0	14.3	88.8
3	077-2	216.41	222.50	6.10	15.7	15.6	19.2	77.9	10.9	80.7
3	077-2	222.50	225.86	3.35	21.2	20.0	26.4	79.5	10.9	82.8
3	077-2	229.82	234.70	4.88	34.0	33.7	44.8	81.6	15.2	87.3
3	077-2	234.70	240.79	6.10	37.8	37.0	49.9	81.7	15.5	87.6

3	077-2	240.79	249.94	9.14	35.9	35.7	46.3	79.6	17.3	85.5
3	077-2	249.94	280.42	30.48	53.8	53.2	78.8	91.1	8.4	97.1
3	077-2	280.42	286.82	6.40	35.5	36.3	47.6	83.1	14.5	88.9
1	28-02	3302.30	579.12	701.65	180.0	-70.00				
2	28-02	60.96	180.0	-61.00						
2	28-02	121.92	180.0	-57.00						
2	28-02	182.88	180.0	-51.00						
2	28-02	304.80	180.0	-53.00						
2	28-02	365.76	180.0	-51.00						
2	28-02	426.72	180.0	-46.00						
2	28-02	487.68	180.0	-44.00						
2	28-02	548.64	180.0	-39.00						
2	28-02	609.60	180.0	-45.00						
2	28-02	670.56	180.0	-51.00						
3	28-02	37.80	43.89	6.10	27.5	27.4	34.6	77.7	18.0	83.3
3	28-02	43.89	47.24	3.35	36.0	36.0	47.3	81.4	15.6	87.2
3	28-02	50.60	54.86	4.27	28.7	28.7	37.2	80.0	17.1	85.9
3	28-02	208.79	210.62	1.83	43.2	43.1	56.8	81.2	16.3	87.2
3	28-02	223.11	229.21	6.10	35.8	35.7	44.6	76.7	19.8	82.6
3	28-02	229.21	235.31	6.10	42.9	43.0	56.0	80.4	17.3	86.5
3	28-02	235.31	241.40	6.10	36.9	37.7	46.1	76.5	20.5	82.7
3	28-02	241.40	247.19	5.79	33.5	33.8	42.0	77.5	18.7	83.3
3	28-02	252.37	258.47	6.10	36.0	36.2	40.6	68.4	27.8	74.7
3	28-02	258.47	263.35	4.88	27.7	27.5	31.3	68.8	26.6	74.8
3	28-02	269.44	275.54	6.10	25.5	25.6	27.2	64.8	29.1	70.6
3	28-02	275.54	281.33	5.79	20.0	20.1	19.9	61.3	29.0	65.8
3	28-02	320.04	323.09	3.05	14.0	14.1	14.5	63.3	30.0	68.9
3	28-02	323.09	329.18	6.10	17.3	17.1	19.0	66.9	27.8	72.7
3	28-02	329.18	335.28	6.10	14.8	15.0	15.8	65.4	28.2	70.9
3	28-02	345.34	351.43	6.10	20.6	20.7	21.5	63.1	31.5	69.2
3	28-02	351.43	354.79	3.35	18.8	19.1	19.4	63.2	29.5	68.5
3	28-02	365.15	371.25	6.10	16.8	16.8	16.1	58.5	32.5	63.4
3	28-02	371.25	377.34	6.10	18.4	17.5	19.6	65.3	27.1	70.4
3	28-02	377.34	379.78	2.44	21.1	21.2	23.6	68.6	25.7	74.2
3	28-02	385.27	391.36	6.10	21.1	21.3	23.6	68.8	25.3	74.3
3	28-02	391.36	397.46	6.10	25.3	25.0	28.7	69.4	25.5	75.2
3	28-02	397.46	403.56	6.10	21.8	21.8	24.4	68.9	25.2	74.4
3	28-02	403.56	409.65	6.10	19.3	19.2	19.9	63.1	29.4	68.4
3	28-02	409.65	414.83	5.18	20.2	20.1	22.4	67.9	27.2	73.9
3	28-02	416.97	423.06	6.10	19.8	20.1	21.8	67.3	27.4	73.1
3	28-02	423.06	429.16	6.10	19.6	19.8	22.4	70.3	24.5	76.0
3	28-02	429.16	435.25	6.10	20.3	20.5	22.8	68.7	25.9	74.4
3	28-02	435.25	441.35	6.10	18.3	18.3	20.0	66.7	28.1	72.7
3	28-02	441.35	447.45	6.10	18.7	19.0	20.1	65.1	29.4	71.0
3	28-02	447.45	452.02	4.57	20.9	20.9	24.5	71.8	23.6	77.6
3	28-02	452.02	458.11	6.10	14.4	14.6	15.5	66.4	26.6	71.5
3	28-02	458.11	464.21	6.10	17.9	18.1	20.0	68.3	26.7	74.2
3	28-02	464.21	470.31	6.10	18.4	18.4	20.8	69.3	25.5	75.1
3	28-02	470.31	476.40	6.10	20.0	20.4	22.9	70.0	24.7	75.7
3	28-02	476.40	482.50	6.10	16.6	17.0	17.6	64.7	29.3	70.4

3	28-02	482.50	488.59	6.10	16.5	14.8	15.0	54.6	37.8	60.4
3	28-02	488.59	494.69	6.10	22.5	22.2	26.4	71.9	23.5	77.7
3	28-02	494.69	500.79	6.10	30.1	29.9	35.3	71.8	24.1	77.8
3	28-02	500.79	506.88	6.10	19.6	19.7	20.9	65.0	29.0	70.7
3	28-02	506.88	512.98	6.10	24.0	24.0	27.5	70.2	24.5	75.8
3	28-02	512.98	516.03	3.05	29.9	31.7	36.3	74.6	21.5	80.6
3	28-02	518.77	519.68	0.91	30.7	30.8	38.3	77.1	19.0	82.8
3	28-02	524.87	530.96	6.10	31.2	30.9	36.5	71.9	23.6	77.7
3	28-02	530.96	537.06	6.10	30.6	30.9	37.1	74.3	22.5	80.5
3	28-02	537.06	540.41	3.35	30.2	30.0	36.4	74.1	22.2	80.1
3	28-02	549.25	555.35	6.10	27.4	27.1	33.8	75.9	20.8	81.9
3	28-02	555.35	561.44	6.10	38.1	38.7	48.7	78.5	19.4	84.9
3	28-02	561.44	564.79	3.35	41.6	42.4	54.5	80.6	17.5	86.9
3	28-02	564.79	571.20	6.40	40.1	40.2	53.6	82.2	16.6	88.6
3	28-02	571.20	577.29	6.10	39.4	39.6	49.8	77.4	20.1	83.7
3	28-02	577.29	583.39	6.10	40.1	40.0	51.0	78.0	19.7	84.3
3	28-02	583.39	589.48	6.10	43.4	43.6	56.3	79.7	18.5	86.0
3	28-02	589.48	595.58	6.10	47.4	48.0	63.3	82.2	16.4	88.6
3	28-02	595.58	601.98	6.40	40.5	40.9	54.2	82.6	15.5	88.7
3	28-02	604.42	609.60	5.18	18.2	18.3	20.9	70.9	22.3	75.9
3	28-02	609.60	613.87	4.27	16.1	16.4	17.5	66.7	27.2	72.2
1	24-02	3454.60	61.45	713.23	180.0	-68.00				
2	24-02	30.48	180.0	-65.00						
2	24-02	60.96	180.0	-64.33						
2	24-02	121.92	180.0	-63.75						
2	24-02	182.88	180.0	-62.50						
2	24-02	243.85	180.0	-62.50						
2	24-02	304.80	180.0	-58.75						
2	24-02	364.85	180.0	-61.25						
2	24-02	426.72	180.0	-63.17						
2	24-02	486.16	180.0	-62.50						
3	24-02	199.03	205.13	6.10	19.3	19.0	21.6	69.6	22.8	74.4
3	24-02	205.13	211.23	6.10	17.7	17.9	19.8	69.1	23.7	74.1
3	24-02	211.23	217.32	6.10	27.0	27.3	33.5	76.9	18.4	82.3
3	24-02	217.32	223.42	6.10	27.4	26.9	32.8	73.9	21.0	79.4
3	24-02	223.42	229.51	6.10	24.7	24.9	29.2	73.1	21.1	78.4
3	24-02	229.51	235.61	6.10	22.0	22.0	25.0	70.3	23.0	75.3
3	24-02	235.61	241.71	6.10	21.9	22.2	26.6	75.4	18.8	80.5
3	24-02	241.71	247.80	6.10	24.8	25.6	31.2	78.3	16.8	83.6
3	24-02	247.80	253.90	6.10	27.0	27.2	35.8	82.2	14.7	87.9
3	24-02	253.90	259.99	6.10	28.0	27.9	35.4	78.3	17.5	83.9
3	24-02	259.99	266.09	6.10	25.6	25.3	31.9	77.2	17.8	82.5
3	24-02	266.09	272.19	6.10	26.5	26.2	33.2	77.7	18.1	83.3
3	24-02	272.19	278.28	6.10	26.6	26.4	34.2	79.6	16.9	85.3
3	24-02	278.28	284.38	6.10	28.8	28.5	35.7	76.3	19.8	82.0
3	24-02	284.38	290.47	6.10	27.3	26.5	32.7	74.2	20.5	79.5
3	24-02	290.47	296.57	6.10	30.5	30.6	39.3	79.5	17.3	85.3
3	24-02	296.57	301.75	5.18	18.0	17.9	19.2	66.0	26.5	71.0
3	24-02	314.86	316.38	1.52	30.6	30.8	41.0	82.7	15.0	88.7
3	24-02	323.09	327.36	4.27	36.5	36.1	47.6	80.5	17.1	86.6

3	24-02	327.36	328.88	1.52	33.7	33.8	40.8	74.0	22.4	80.1
3	24-02	328.88	334.06	5.18	31.3	31.4	38.4	75.7	20.1	81.4
3	24-02	334.06	336.19	2.13	11.9	23.5	11.2	58.7	29.8	62.6
3	24-02	336.19	342.29	6.10	37.3	24.3	49.5	81.9	15.6	87.8
3	24-02	342.29	348.39	6.10	55.8	55.9	75.2	82.6	16.8	89.3
3	24-02	348.39	354.48	6.10	40.5	39.7	54.0	83.2	12.9	88.5
3	24-02	354.48	360.58	6.10	42.8	42.6	56.9	81.7	16.9	88.1
3	24-02	360.58	369.72	9.14	39.1	39.1	51.9	82.4	14.5	88.1
3	24-02	369.72	375.82	6.10	40.2	40.2	55.0	85.2	12.0	90.7
3	24-02	375.82	381.91	6.10	39.0	38.7	50.6	80.1	17.2	86.0
3	24-02	381.91	386.49	4.57	42.8	40.0	52.7	77.7	14.0	81.6
1	09-06	3454.60	-182.88	734.31		180.0	-85.00			
2	09-06	60.96	180.0	-90.00						
2	09-06	118.87	180.0	-90.00						
3	09-06	12.80	18.29	5.49	21.9	21.8	25.3	72.1	20.0	76.6
3	09-06	18.29	24.38	6.10	17.3	17.9	19.4	70.0	20.9	74.2
3	09-06	24.38	30.48	6.10	18.4	18.9	20.0	68.3	22.0	72.3
3	09-06	30.48	36.58	6.10	25.3	27.6	31.8	78.3	16.8	83.5
3	09-06	36.58	42.67	6.10	18.1	20.0	22.3	77.4	15.0	81.5
3	09-06	42.67	48.77	6.10	22.0	22.3	25.9	73.5	19.0	78.1
3	09-06	48.77	54.86	6.10	17.7	18.2	17.6	62.3	26.2	66.1
3	09-06	54.86	60.96	6.10	20.1	20.5	22.4	69.4	21.6	73.7
3	09-06	60.96	67.06	6.10	24.9	29.2	31.8	79.6	15.6	84.7
3	09-06	67.06	73.15	6.10	22.6	23.5	26.3	71.9	22.2	77.1
3	09-06	73.15	79.25	6.10	16.6	17.1	16.1	59.7	30.5	64.3
3	09-06	79.25	85.34	6.10	18.5	18.4	19.0	62.9	28.9	67.9
3	09-06	85.34	91.44	6.10	16.7	17.7	18.7	69.4	22.2	73.9
3	09-06	91.44	97.54	6.10	22.2	22.5	28.0	78.6	16.3	83.7
3	09-06	97.54	103.63	6.10	25.2	25.2	30.0	73.4	22.0	79.1
3	09-06	115.82	121.92	6.10	22.1	20.7	27.8	78.7	15.4	83.6
1	29-03	3454.60	-243.84	740.66		180.0	-60.00			
2	29-03	60.96	180.0	-58.00						
2	29-03	121.92	180.0	-60.00						
2	29-03	182.88	180.0	-59.00						
2	29-03	243.84	180.0	-61.00						
3	29-03	38.71	45.72	7.01	11.1	11.2	14.1	79.8	14.1	84.5
3	29-03	45.72	51.82	6.10	25.2	26.6	32.9	80.6	16.5	86.4
3	29-03	51.82	57.91	6.10	25.3	25.8	33.3	81.8	14.8	87.3
3	29-03	70.10	76.20	6.10	21.1	22.2	27.4	81.1	14.2	86.2
3	29-03	76.20	82.30	6.10	24.2	24.6	32.4	83.6	12.6	89.0
3	29-03	82.30	88.39	6.10	21.6	22.6	28.4	82.1	13.2	87.2
3	29-03	88.39	94.49	6.10	17.6	18.1	21.4	76.0	17.4	80.7
3	29-03	94.49	100.58	6.10	23.7	24.3	29.7	77.5	17.8	82.9
3	29-03	100.58	106.68	6.10	21.8	22.6	27.9	80.1	14.1	84.9
3	29-03	106.68	112.78	6.10	27.7	27.7	37.7	85.0	11.2	90.2
3	29-03	112.78	118.87	6.10	27.7	28.4	37.4	84.2	12.2	89.6
3	29-03	118.87	124.97	6.10	21.8	22.9	28.9	82.7	13.2	88.0
3	29-03	124.97	131.06	6.10	26.7	27.7	35.0	81.6	14.4	86.9
3	29-03	131.06	137.16	6.10	26.9	27.9	35.3	81.3	15.1	86.9
3	29-03	137.16	143.26	6.10	27.7	28.6	36.2	81.0	15.7	86.6

3	29-03	143.26	149.35	6.10	25.3	26.1	33.1	81.2	14.8	86.6
3	29-03	149.35	155.45	6.10	20.9	21.9	26.7	79.4	16.2	84.8
3	29-03	155.45	161.54	6.10	32.0	31.8	42.2	82.1	14.3	87.6
3	29-03	161.54	167.64	6.10	32.9	33.6	42.0	79.0	17.5	84.7
3	29-03	167.64	173.74	6.10	23.9	24.6	29.2	75.7	19.2	81.1
3	29-03	173.74	180.75	7.01	23.7	24.3	28.1	73.7	19.6	78.6
3	29-03	180.75	182.88	2.13	13.8	14.2	12.0	54.2	32.9	57.9
3	29-03	231.04	233.48	2.44	29.8	30.3	37.8	78.1	19.0	84.1
1	27-05	3454.60	883.92	665.68	180.0	-60.00				
2	27-05	60.96	180.0	-55.50						
2	27-05	121.92	180.0	-53.00						
2	27-05	182.88	180.0	-49.00						
2	27-05	243.84	180.0	-46.00						
2	27-05	304.80	180.0	-45.00						
3	27-05	135.64	141.73	6.10	35.0	35.3	46.9	83.3	13.4	88.8
3	27-05	141.73	147.83	6.10	34.2	34.7	46.6	85.1	11.7	90.5
3	27-05	147.83	150.57	2.74	27.6	27.7	35.4	79.6	15.9	85.0
3	27-05	156.67	163.07	6.40	27.8	28.3	35.7	79.6	16.2	85.0
3	27-05	163.07	167.03	3.96	15.5	15.5	16.7	67.1	23.5	71.3
3	27-05	169.77	176.78	7.01	26.8	26.8	34.3	79.6	15.7	84.9
3	27-05	176.78	182.88	6.10	22.4	22.2	26.4	73.4	19.9	78.2
3	27-05	182.88	188.98	6.10	29.3	29.5	37.8	80.3	15.1	85.5
3	27-05	188.98	191.11	2.13	35.6	35.3	47.2	82.0	15.2	87.9
3	27-05	587.35	587.96	0.61	3.7	3.9	1.3	31.6	22.7	23.8
3	27-05	587.96	590.70	2.74	10.7	11.0	11.4	67.1	21.7	70.6
3	27-05	595.88	598.93	3.05	11.8	11.8	9.5	49.9	35.6	53.3
3	27-05	598.93	604.72	5.79	39.7	40.5	49.1	75.4	22.5	82.0
3	27-05	604.72	606.25	1.52	24.7	24.9	22.6	54.7	38.1	60.7
3	27-05	606.25	609.90	3.66	31.4	31.4	37.7	73.3	23.5	79.5
1	01-13	3454.60	731.52	676.52	180.0	-70.00				
2	01-13	60.96	180.0	-65.00						
2	01-13	121.92	180.0	-65.00						
2	01-13	179.83	180.0	-62.50						
3	01-13	28.35	34.44	6.10	34.3	34.9	43.9	79.1	17.2	84.8
3	01-13	34.44	40.54	6.10	33.4	34.0	44.6	83.0	13.5	88.4
3	01-13	40.54	46.63	6.10	28.5	26.8	36.6	79.9	15.8	85.3
3	01-13	52.73	58.83	6.10	24.4	32.7	31.4	80.7	13.4	85.4
3	01-13	58.83	64.92	6.10	10.8	15.5	10.5	61.6	24.1	64.3
3	01-13	64.92	71.02	6.10	19.6	27.7	24.3	77.3	16.4	82.0
3	01-13	71.02	77.11	6.10	23.7	23.9	28.9	75.9	17.7	80.7
3	01-13	77.11	83.21	6.10	29.4	30.1	36.4	76.9	17.7	82.0
3	01-13	87.48	92.96	5.49	19.6	21.0	21.5	68.1	23.7	72.7
3	01-13	111.25	117.35	6.10	26.7	26.7	32.5	75.9	18.2	80.9
3	01-13	117.35	123.44	6.10	31.5	32.3	39.0	76.6	18.9	82.1
3	01-13	123.44	129.54	6.10	24.7	23.7	28.5	71.0	23.1	76.3
3	01-13	135.03	141.12	6.10	19.5	18.5	22.5	71.6	21.8	76.6
3	01-13	143.26	149.35	6.10	27.7	27.8	34.4	77.0	18.0	82.4
3	01-13	149.35	155.45	6.10	35.1	36.3	45.4	80.3	15.3	85.6
3	01-13	155.45	160.32	4.88	36.2	36.7	45.4	77.7	18.2	83.3
3	01-13	171.60	176.48	4.88	35.1	35.0	45.6	80.6	15.3	86.0

1	04-11	3454.60	518.16	680.50	180.0	-60.00					
2	04-11	60.96	180.0	-59.00							
2	04-11	121.92	180.0	-54.00							
3	04-11	55.47	64.92	9.45	28.3	29.6	35.8	78.4	17.5	83.9	
3	04-11	168.55	177.70	9.14	36.5	37.2	48.2	82.0	14.6	87.6	
1	04-10	3454.60	335.28	693.75	180.0	-60.00					
2	04-10	60.96	180.0	-55.00							
2	04-10	121.92	180.0	-54.50							
3	04-10	21.34	27.43	6.10	34.6	37.7	44.0	78.8	17.2	84.4	
3	04-10	27.43	33.53	6.10	37.9	38.6	47.6	77.5	19.3	83.4	
3	04-10	33.53	39.62	6.10	39.5	40.5	51.5	80.5	16.4	86.3	
3	04-10	39.62	45.72	6.10	42.6	42.8	57.5	83.6	14.0	89.5	
3	04-10	45.72	51.82	6.10	36.0	37.4	46.2	79.3	17.5	85.1	
3	04-10	51.82	57.91	6.10	32.4	35.5	41.1	78.7	16.9	84.1	
3	04-10	57.91	64.01	6.10	41.1	40.3	49.8	74.3	22.0	80.3	
3	04-10	64.01	70.10	6.10	35.9	37.8	45.3	77.9	18.3	83.6	
3	04-10	70.10	76.20	6.10	32.8	34.3	38.2	71.4	23.6	77.1	
3	04-10	76.20	82.30	6.10	35.6	36.8	42.7	73.6	22.4	79.4	
3	04-10	82.30	88.39	6.10	40.4	40.8	48.9	74.2	22.4	80.3	
3	04-10	88.39	94.49	6.10	41.5	42.0	53.0	78.9	18.1	84.8	
3	04-10	94.49	97.54	3.05	36.3	36.8	44.2	74.8	21.8	80.8	
3	04-10	102.72	109.73	7.01	23.2	24.2	26.3	70.6	22.0	75.3	
3	04-10	109.73	115.82	6.10	20.8	19.6	24.3	71.5	23.4	77.2	
3	04-10	115.82	121.92	6.10	24.5	24.6	29.4	74.1	20.8	79.5	
1	08-05	3607.20	-365.76	756.82	180.0	-85.00					
2	08-05	60.96	180.0	-85.00							
2	08-05	121.92	180.0	-85.00							
2	08-05	182.88	180.0	-85.00							
3	08-05	21.34	27.43	6.10	21.4	21.3	26.2	75.1	20.9	80.9	
3	08-05	27.43	33.53	6.10	28.2	29.4	36.1	79.0	17.7	84.8	
3	08-05	33.53	42.67	9.14	33.6	33.6	44.6	81.8	16.2	88.0	
3	08-05	114.30	121.92	7.62	27.9	29.7	34.4	75.5	21.7	81.7	
3	08-05	129.54	137.16	7.62	30.0	28.3	34.3	69.4	27.2	75.9	
3	08-05	137.16	144.78	7.62	34.9	34.0	42.0	73.4	23.6	79.7	
3	08-05	158.50	164.59	6.10	39.6	40.3	49.6	76.6	21.1	83.0	
3	08-05	164.59	170.69	6.10	39.0	39.6	51.8	81.9	16.1	88.1	
3	08-05	170.69	176.78	6.10	47.0	46.6	65.6	86.3	12.6	92.5	
3	08-05	176.78	182.88	6.10	37.2	36.8	47.7	78.9	18.5	85.0	
3	08-05	182.88	188.98	6.10	19.4	20.1	23.2	73.8	21.0	79.2	
1	08-06	3607.2	-182.88	765.80	180.0	-85.00					
2	08-06	60.96	180.0	-81.00							
2	08-06	121.92	180.0	-78.50							
2	08-06	182.88	180.0	-77.00							
2	08-06	243.84	180.0	-73.00							
2	08-06	259.08	180.0	-72.00							
3	08-06	7.62	13.72	6.10	23.0	21.5	24.5	64.4	30.1	70.4	
3	08-06	13.72	19.81	6.10	21.4	23.3	21.4	60.5	33.0	66.4	
3	08-06	36.58	42.67	6.10	21.9	21.7	23.4	65.4	27.7	70.7	
3	08-06	42.67	45.72	3.05	28.1	27.6	31.7	69.2	25.7	74.9	
3	08-06	45.72	51.82	6.10	33.6	33.8	42.3	77.5	19.3	83.5	

3	08-06	57.91	64.01	6.10	21.9	22.5	22.2	61.7	31.2	67.2
3	08-06	64.01	70.10	6.10	23.4	23.8	24.8	65.1	27.6	70.2
3	08-06	70.10	76.20	6.10	25.9	25.7	30.2	71.7	22.9	77.2
3	08-06	76.20	82.30	6.10	26.3	25.4	32.1	75.3	20.3	80.9
3	08-06	82.30	88.39	6.10	26.7	27.2	31.3	72.0	23.2	77.8
3	08-06	88.39	94.49	6.10	29.1	28.6	34.7	73.5	21.8	79.2
3	08-06	94.49	100.58	6.10	25.9	26.6	30.8	73.0	22.5	78.8
3	08-06	106.68	112.78	6.10	22.1	21.1	25.9	72.8	20.8	77.8
3	08-06	112.78	118.87	6.10	21.7	22.1	24.3	69.0	25.0	74.5
3	08-06	118.87	124.97	6.10	24.4	24.3	28.2	70.8	24.0	76.4
3	08-06	124.97	131.06	6.10	21.3	21.3	23.8	68.7	25.3	74.1
3	08-06	131.06	137.16	6.10	31.9	32.3	40.2	77.7	19.0	83.7
3	08-06	137.16	143.26	6.10	28.5	27.4	35.5	77.2	18.0	82.6
3	08-06	143.26	149.35	6.10	27.0	27.3	33.1	75.8	19.0	81.0
3	08-06	149.35	155.45	6.10	24.5	23.2	30.7	78.1	16.6	83.2
3	08-06	155.45	161.54	6.10	27.8	28.3	35.0	78.1	17.3	83.5
3	08-06	161.54	167.64	6.10	25.8	24.3	32.9	79.4	15.6	84.5
3	08-06	167.64	173.74	6.10	31.4	30.0	40.2	79.5	16.2	85.0
3	08-06	173.74	179.83	6.10	28.0	27.2	36.7	81.5	14.9	87.0
3	08-06	179.83	185.93	6.10	35.6	35.0	47.6	82.9	14.3	88.7
3	08-06	185.93	192.02	6.10	22.6	21.0	28.1	77.4	17.1	82.5
3	08-06	192.02	198.12	6.10	20.1	20.7	24.0	73.8	20.7	79.1
3	08-06	198.12	204.22	6.10	18.9	18.3	23.8	78.3	16.8	83.5
3	08-06	204.22	210.31	6.10	17.1	15.7	20.5	75.0	17.9	79.5
3	08-06	217.93	224.03	6.10	23.6	23.6	29.8	78.5	16.5	83.7
3	08-06	224.03	230.12	6.10	26.5	25.1	32.9	76.8	19.1	82.4
3	08-06	230.12	236.22	6.10	18.0	17.5	20.2	70.0	22.3	74.6
3	08-06	236.22	242.32	6.10	30.9	27.8	36.4	72.2	23.8	78.2
3	08-06	242.32	248.41	6.10	29.2	28.5	35.2	74.4	21.1	80.1
3	08-06	248.41	254.51	6.10	16.8	16.2	18.0	66.6	24.9	71.2
3	08-06	254.51	259.08	4.57	13.0	11.6	13.0	62.5	25.3	65.9
1	08-07	3607.20	0.0	749.52		180.0	-85.00			
2	08-07	60.96	180.0	-84.00						
3	08-07	33.53	42.67	9.14	16.6	0.0	17.5	66.0	23.4	69.8
3	08-07	42.67	48.77	6.10	16.1	16.6	17.1	66.7	23.1	70.6
3	08-07	48.77	54.86	6.10	20.8	16.9	24.7	73.9	19.6	78.8
3	08-07	54.86	60.96	6.10	15.2	15.0	17.1	70.2	21.5	74.6
3	08-07	60.96	67.06	6.10	19.1	19.5	20.7	66.7	26.3	71.9
3	08-07	73.15	79.25	6.10	19.5	20.3	21.2	67.3	24.3	71.9
3	08-07	79.25	85.34	6.10	24.3	24.6	28.5	72.5	22.1	78.0
1	27-03	3607.20	243.84	713.84		180.0	-68.00			
2	27-03	30.48	180.0	-66.16						
2	27-03	60.96	180.0	-66.00						
2	27-03	121.92	180.0	-62.50						
2	27-03	152.40	180.0	-57.75						
2	27-03	182.88	180.0	-54.92						
2	27-03	243.84	180.0	-55.25						
2	27-03	304.80	180.0	-53.92						
2	27-03	365.76	180.0	-53.92						
2	27-03	426.72	180.0	-57.75						

2	27-03	487.68		180.0	-60.00					
2	27-03	524.26		180.0	-59.00					
3	27-03	27.43	33.53	6.10	33.2	33.9	40.6	75.3	20.8	81.1
3	27-03	33.53	37.80	4.27	36.8	36.7	37.4	60.8	34.8	67.4
3	27-03	46.02	49.07	3.05	29.6	30.3	30.3	61.5	33.9	68.0
3	27-03	52.43	55.47	3.05	16.4	15.9	13.9	52.2	35.0	56.1
3	27-03	55.47	61.57	6.10	28.5	28.4	35.0	75.8	19.9	81.5
3	27-03	61.57	67.67	6.10	33.9	33.2	41.6	75.4	21.0	81.3
3	27-03	67.67	73.76	6.10	36.3	36.3	47.0	79.9	17.2	85.9
3	27-03	73.76	79.86	6.10	22.3	22.5	27.0	74.9	20.5	80.4
3	27-03	79.86	85.95	6.10	31.1	31.1	38.8	76.5	20.8	82.7
3	27-03	85.95	92.05	6.10	18.7	18.1	21.1	69.6	24.4	75.0
3	27-03	92.05	98.15	6.10	24.1	24.0	28.1	71.2	24.2	77.1
3	27-03	98.15	104.24	6.10	32.5	33.7	41.2	78.2	18.5	84.1
3	27-03	108.20	111.25	3.05	22.8	23.1	25.1	67.2	27.0	72.9
3	27-03	111.25	117.35	6.10	34.8	35.1	43.6	77.2	19.6	83.2
3	27-03	117.35	123.44	6.10	32.1	32.2	40.1	76.9	20.0	83.0
3	27-03	123.44	129.54	6.10	32.2	32.9	40.4	77.0	20.3	83.2
3	27-03	129.54	135.64	6.10	20.8	21.0	25.7	76.6	18.3	81.9
3	27-03	135.64	139.29	3.66	18.0	18.0	20.7	71.3	22.1	76.3
3	27-03	141.73	142.95	1.22	17.1	17.3	20.7	74.8	19.8	80.1
3	27-03	145.08	151.18	6.10	29.6	29.6	36.8	76.8	19.5	82.6
3	27-03	151.18	157.28	6.10	28.3	28.0	36.0	78.6	18.1	84.5
3	27-03	157.28	160.02	2.74	31.4	31.3	39.5	77.5	18.7	83.3
3	27-03	170.08	176.17	6.10	29.1	29.0	33.2	69.0	27.6	75.5
3	27-03	176.17	178.00	1.83	30.5	30.7	35.3	69.6	28.3	76.6
3	27-03	179.22	185.32	6.10	31.3	31.0	37.0	72.2	24.1	78.3
3	27-03	185.32	187.45	2.13	23.5	27.2	24.8	64.5	29.0	70.1
3	27-03	187.45	188.67	1.22	43.0	43.2	51.8	73.1	25.2	80.0
3	27-03	188.67	194.77	6.10	19.3	19.4	19.2	60.4	32.5	66.0
3	27-03	194.77	200.86	6.10	12.9	13.0	10.7	50.9	36.0	54.8
3	27-03	200.86	206.96	6.10	14.8	15.1	14.3	59.3	30.6	63.8
3	27-03	206.96	213.06	6.10	17.2	17.1	17.8	63.5	28.8	68.7
3	27-03	215.49	217.02	1.52	16.0	16.0	17.4	66.6	26.6	71.9
3	27-03	217.93	224.03	6.10	7.7	7.7	6.4	52.0	34.0	55.4
3	27-03	224.03	230.12	6.10	15.5	15.7	16.9	67.6	24.7	72.4
3	27-03	230.12	236.22	6.10	9.4	9.5	9.0	60.4	27.4	64.0
3	27-03	236.22	242.32	6.10	10.4	10.4	9.2	54.7	32.4	58.4
3	27-03	242.32	248.41	6.10	18.9	18.8	20.5	66.8	26.2	71.9
3	27-03	249.94	254.51	4.57	11.0	10.9	10.1	57.4	30.4	61.2
3	27-03	255.42	258.78	3.35	17.0	16.8	18.0	65.4	26.8	70.4
3	27-03	259.99	266.09	6.10	20.8	21.0	23.5	69.4	25.2	75.0
3	27-03	266.09	272.19	6.10	17.7	18.0	18.6	63.9	29.5	69.5
3	27-03	272.19	278.28	6.10	15.0	15.0	16.8	69.5	23.6	74.5
3	27-03	278.28	284.38	6.10	17.6	17.4	17.9	62.2	30.1	67.4
3	27-03	284.38	290.47	6.10	14.8	14.4	11.9	49.6	36.7	53.3
3	27-03	290.47	296.57	6.10	25.6	25.4	28.0	67.0	26.8	72.5
3	27-03	296.57	299.01	2.44	16.5	16.5	17.0	63.6	27.7	68.4
3	27-03	307.24	313.33	6.10	15.5	15.4	16.8	67.2	24.9	72.0
3	27-03	313.33	319.43	6.10	15.0	15.0	15.2	62.4	28.5	67.1

3	27-03	319.43	325.53	6.10	21.6	21.6	24.9	71.3	22.7	76.6
3	27-03	325.53	331.62	6.10	27.4	27.4	34.3	77.4	18.9	83.1
3	27-03	331.62	337.72	6.10	25.5	25.9	30.9	74.5	21.3	80.3
3	27-03	337.72	343.81	6.10	21.8	19.5	27.4	77.9	18.0	83.5
3	27-03	343.81	349.91	6.10	23.0	23.0	28.3	76.1	19.6	81.7
3	27-03	349.91	356.01	6.10	18.4	18.5	21.8	73.7	20.2	78.8
3	27-03	356.01	362.10	6.10	26.8	27.1	32.2	74.0	21.7	79.8
3	27-03	362.10	368.20	6.10	29.6	26.7	31.9	69.2	17.1	71.6
3	27-03	368.20	374.60	6.40	25.2	25.1	30.3	74.1	21.2	79.7
3	27-03	374.60	380.70	6.10	18.3	18.5	20.6	69.3	24.3	74.6
3	27-03	380.70	386.79	6.10	23.5	23.3	26.0	67.8	26.4	73.5
3	27-03	386.79	392.89	6.10	24.2	24.3	25.9	65.6	27.8	71.0
3	27-03	392.89	394.11	1.22	9.7	9.8	8.3	55.2	26.9	56.8
3	27-03	421.84	427.94	6.10	27.4	27.2	35.0	79.4	15.9	84.7
3	27-03	427.94	434.04	6.10	36.8	36.5	44.6	74.7	21.2	80.5
3	27-03	434.04	437.69	3.66	37.9	37.7	49.5	80.8	16.1	86.6
3	27-03	437.69	439.52	1.83	14.1	13.8	16.7	74.8	15.8	78.5
3	27-03	439.52	441.05	1.52	11.5	11.3	9.9	53.5	33.1	57.1
3	27-03	441.05	447.14	6.10	43.3	43.2	58.8	84.1	14.0	90.1
3	27-03	447.14	453.24	6.10	43.0	42.9	58.9	84.9	13.2	90.8
3	27-03	453.24	459.33	6.10	40.3	40.8	54.3	83.4	14.1	89.3
3	27-03	459.33	465.43	6.10	38.1	38.1	49.5	80.2	17.2	86.2
3	27-03	465.43	471.53	6.10	39.7	39.4	52.3	81.5	15.8	87.4
3	27-03	471.53	477.62	6.10	38.4	38.3	48.8	78.2	18.7	84.1
3	27-03	477.62	479.45	1.83	24.7	25.0	30.0	74.7	21.3	80.6
1	035-2	3607.20	-274.32	768.10	180.0	-55.00				
2	035-2	60.96	180.0	-59.00						
2	035-2	121.92	180.0	-57.00						
3	035-2	81.69	85.34	3.66	20.8	20.7	24.5	73.7	18.5	78.1
3	035-2	85.34	91.44	6.10	25.1	25.6	31.3	77.8	16.7	82.8
3	035-2	91.44	97.54	6.10	31.5	32.2	41.6	82.3	13.7	87.6
3	035-2	97.54	103.63	6.10	27.1	27.5	36.0	82.6	13.3	87.8
3	035-2	103.63	109.73	6.10	33.8	34.2	47.7	88.1	9.3	93.5
3	035-2	109.73	115.82	6.10	36.2	36.0	48.6	83.4	13.6	89.1
3	035-2	115.82	121.92	6.10	41.6	41.8	56.4	83.7	14.4	89.8
3	035-2	128.02	134.11	6.10	31.0	31.0	40.5	81.2	15.0	86.7
3	035-2	134.11	140.21	6.10	38.7	39.3	55.0	88.4	10.3	94.3
3	035-2	140.21	146.30	6.10	23.1	22.9	31.8	86.0	10.6	91.3
3	035-2	146.30	152.40	6.10	30.5	30.1	44.0	90.2	7.7	95.7
3	035-2	152.40	158.50	6.10	34.4	34.8	50.0	90.6	7.8	96.2
3	035-2	158.50	164.59	6.10	41.2	41.2	57.3	86.6	10.9	92.3
3	035-2	164.59	170.69	6.10	44.5	44.3	61.7	85.8	12.8	91.9
3	035-2	170.69	176.78	6.10	30.6	30.9	37.8	75.9	20.9	82.0
3	035-2	176.78	182.88	6.10	34.1	34.8	43.3	77.8	19.8	84.1
3	035-2	182.88	195.07	12.19	19.9	20.0	18.9	58.5	31.3	63.0
3	035-2	195.07	201.17	6.10	33.2	32.8	42.7	79.4	17.5	85.3
3	035-2	201.17	207.26	6.10	39.7	39.9	53.8	84.0	13.7	89.9
3	035-2	207.26	213.36	6.10	37.1	37.8	49.6	82.8	14.5	88.7
3	035-2	213.36	219.46	6.10	35.8	36.2	44.8	77.3	18.7	83.0
3	035-2	219.46	222.50	3.05	14.8	15.0	17.5	73.4	20.2	78.4

1	035-3	3607.20	-457.20	762.90	180.0	-50.00					
2	035-3	60.96	180.0	-51.00							
2	035-3	121.92	180.0	-46.50							
2	035-3	158.50	180.0	-50.00							
3	035-3	28.65	30.48	1.83	49.9	49.9	72.8	90.8	8.2	96.7	
3	035-3	30.48	36.58	6.10	37.7	38.0	51.6	85.2	12.2	90.8	
3	035-3	36.58	42.67	6.10	39.0	39.5	53.1	84.2	13.8	90.2	
3	035-3	42.67	46.33	3.66	31.4	32.2	39.2	77.0	19.2	82.8	
3	035-3	54.86	59.44	4.57	33.6	33.7	45.0	83.2	14.0	88.9	
3	035-3	75.59	79.25	3.66	43.3	43.4	56.0	79.5	18.0	85.7	
3	035-3	79.25	85.34	6.10	36.1	36.3	49.0	84.0	13.6	89.9	
3	035-3	85.34	91.44	6.10	41.8	42.1	59.7	88.9	9.2	94.6	
3	035-3	97.54	103.63	6.10	31.7	32.2	44.7	87.6	11.2	93.7	
3	035-3	103.63	109.73	6.10	25.3	25.7	33.5	81.9	15.7	87.9	
3	035-3	109.73	113.08	3.35	37.1	37.4	50.3	84.1	13.8	90.0	
1	040-1	3607.20	853.40	658.70	180.0	-55.00					
2	040-1	60.96	180.0	-53.00							
2	040-1	121.92	180.0	-51.00							
2	040-1	182.88	180.0	-51.00							
2	040-1	243.84	180.0	-50.00							
2	040-1	304.80	180.0	-45.00							
2	040-1	365.76	180.0	-41.00							
2	040-1	426.72	180.0	-38.50							
2	040-1	487.68	180.0	-34.00							
2	040-1	548.64	180.0	-29.00							
2	040-1	609.60	180.0	-28.00							
2	040-1	670.56	180.0	-22.00							
2	040-1	731.52	180.0	-23.00							
3	040-1	147.83	153.92	6.10	25.1	24.9	30.1	74.4	19.6	79.5	
3	040-1	153.92	160.02	6.10	36.7	35.7	49.2	83.1	14.0	88.8	
3	040-1	160.02	166.12	6.10	34.0	35.2	46.0	83.8	13.5	89.6	
3	040-1	166.12	172.21	6.10	30.8	30.7	41.0	82.6	14.1	88.2	
3	040-1	172.21	178.31	6.10	19.9	19.5	23.9	73.9	20.9	79.4	
3	040-1	181.36	184.40	3.05	27.8	26.2	36.7	82.3	14.0	87.7	
3	040-1	184.40	190.50	6.10	16.9	17.0	20.2	74.9	17.7	79.4	
3	040-1	190.50	196.60	6.10	13.9	13.9	16.0	72.8	18.4	76.8	
3	040-1	196.60	202.69	6.10	24.2	24.7	31.3	80.5	14.7	85.6	
3	040-1	202.69	208.79	6.10	25.4	25.1	31.7	77.5	17.5	82.8	
3	040-1	208.79	214.88	6.10	21.0	20.9	24.7	73.2	19.6	77.9	
3	040-1	214.88	220.37	5.49	31.1	30.8	39.0	77.8	17.6	83.2	
3	040-1	220.37	226.47	6.10	20.1	20.1	24.5	76.0	17.7	80.9	
3	040-1	226.47	232.56	6.10	18.8	18.8	22.2	73.6	19.1	78.2	
3	040-1	232.56	236.22	3.66	14.0	14.0	14.1	63.6	24.4	67.0	
3	040-1	236.22	242.32	6.10	17.4	18.0	20.7	74.3	18.4	78.9	
3	040-1	242.32	248.41	6.10	17.6	17.8	20.0	71.3	20.5	75.6	
3	040-1	248.41	254.51	6.10	24.0	25.0	30.5	79.2	15.2	84.1	
3	040-1	254.51	260.60	6.10	29.2	28.3	37.0	79.3	14.6	84.0	
3	040-1	260.60	267.00	6.40	27.1	27.7	34.3	78.8	15.8	83.8	
3	040-1	267.00	270.97	3.96	20.8	20.6	25.6	76.7	18.0	81.8	
3	040-1	270.97	276.76	5.79	35.5	35.5	45.4	79.0	17.4	84.8	

3	040-1	276.76	278.89	2.13	15.3	15.4	17.6	71.5	21.0	76.2
3	040-1	278.89	284.68	5.79	10.3	10.4	11.1	67.2	23.5	71.4
3	040-1	284.68	286.51	1.83	37.9	37.0	50.6	82.9	14.0	88.5
3	040-1	311.81	315.47	3.66	26.1	25.8	34.0	80.8	15.1	86.2
1	40-2A	3607.20	487.50	681.80		180.0	-62.00			
2	40-2A	60.96	180.0	-55.50						
2	40-2A	121.96	180.0	-53.00						
2	40-2A	182.88	180.0	-49.00						
2	40-2A	243.84	180.0	-46.00						
2	40-2A	304.80	180.0	-41.00						
2	40-2A	365.76	180.0	-38.00						
3	40-2A	33.53	35.97	2.44	9.6	10.3	9.0	59.1	27.3	62.2
3	40-2A	40.84	46.94	6.10	12.8	13.3	14.1	69.8	19.9	73.5
3	40-2A	46.94	53.04	6.10	18.2	18.8	22.6	77.9	15.5	82.4
3	40-2A	53.04	59.13	6.10	20.3	20.3	24.6	75.6	17.5	80.2
3	40-2A	59.13	64.62	5.49	10.9	10.9	11.6	67.9	19.9	70.9
3	40-2A	64.62	70.71	6.10	26.1	26.5	33.3	79.4	16.3	84.8
3	40-2A	70.71	73.15	2.44	39.8	39.9	52.9	82.3	14.9	88.0
3	40-2A	73.15	77.11	3.96	22.2	22.1	25.6	72.1	20.1	76.6
3	40-2A	77.11	81.08	3.96	29.9	29.7	38.4	79.7	16.3	85.2
3	40-2A	107.90	110.95	3.05	34.9	34.8	46.3	82.5	14.1	88.0
3	40-2A	149.96	153.92	3.96	19.5	19.9	23.1	74.3	17.4	78.5
3	40-2A	192.02	198.12	6.10	30.2	30.4	37.6	76.9	19.0	82.6
3	40-2A	198.12	204.22	6.10	36.8	37.3	47.2	79.6	16.4	85.1
3	40-2A	204.22	207.26	3.05	33.3	33.3	41.4	76.8	18.6	82.3
3	40-2A	207.26	210.31	3.05	43.6	41.4	59.9	85.2	12.6	91.0
3	40-2A	210.31	216.41	6.10	41.3	41.4	56.7	85.3	12.4	91.1
3	40-2A	218.54	220.98	2.44	40.0	40.1	53.6	82.9	14.9	88.9
3	40-2A	220.98	222.81	1.83	17.6	18.0	17.8	63.5	25.2	67.2
3	40-2A	222.81	229.82	7.01	38.9	39.5	46.9	74.1	21.7	79.9
3	40-2A	233.78	236.22	2.44	20.1	20.3	24.8	77.0	16.7	81.8
3	40-2A	236.22	239.88	3.66	15.5	15.8	14.8	60.2	26.1	63.1
3	40-2A	239.88	246.28	6.40	44.3	44.8	60.9	85.4	12.5	91.2
3	40-2A	246.28	252.37	6.10	36.5	37.4	43.3	73.0	22.5	78.7
3	40-2A	252.37	258.47	6.10	33.3	33.5	37.3	68.3	27.1	74.3
3	40-2A	258.47	264.57	6.10	41.4	43.6	52.3	77.9	18.8	83.8
3	40-2A	264.57	271.88	7.32	32.1	32.8	40.0	76.8	19.5	82.6
3	40-2A	294.13	300.23	6.10	29.3	29.9	36.2	76.2	19.6	81.8
3	40-2A	300.23	306.32	6.10	26.8	27.1	32.6	75.2	19.9	80.6
3	40-2A	306.32	312.42	6.10	19.4	19.7	22.2	71.3	20.6	75.7
3	40-2A	312.42	318.52	6.10	19.9	20.9	22.0	68.2	24.7	73.2
3	40-2A	318.52	324.61	6.10	34.1	35.0	41.3	74.3	22.3	80.4
3	40-2A	324.61	330.71	6.10	31.1	31.7	38.9	77.1	19.6	83.0
3	40-2A	330.71	336.80	6.10	26.4	26.7	29.9	69.6	25.1	75.3
3	40-2A	336.80	342.90	6.10	26.2	25.0	29.5	69.1	25.2	74.6
3	40-2A	342.90	345.64	2.74	22.5	21.6	24.1	65.6	28.1	71.2
3	40-2A	353.26	359.36	6.10	12.3	12.8	14.0	71.5	19.2	75.4
3	40-2A	359.36	365.46	6.10	11.5	11.3	9.1	50.1	32.7	52.4
3	40-2A	365.46	374.60	9.14	20.5	17.3	26.6	81.0	14.0	86.0
3	40-2A	374.60	383.13	8.53	19.5	19.8	23.7	75.3	19.4	80.5

1	051-2	3607.20	-80.00	731.50	130.35	-60.00				
2	051-2	50.00	130.35	-59.00						
2	051-2	100.00	130.35	-58.00						
2	051-2	150.00	130.35	-58.00						
2	051-2	200.00	130.35	-58.00						
2	051-2	250.00	130.35	-59.00						
2	051-2	300.00	130.35	-60.00						
2	051-2	350.00	130.35	-61.00						
3	051-2	45.72	51.82	6.10	22.1	22.1	25.3	70.2	25.1	76.1
3	051-2	51.82	57.91	6.10	26.9	27.0	31.9	72.8	23.3	78.8
3	051-2	57.91	60.96	3.05	22.5	22.8	26.4	71.9	23.8	77.8
3	051-2	60.96	67.06	6.10	23.7	24.3	27.1	69.7	25.5	75.6
3	051-2	67.06	73.15	6.10	24.1	24.2	26.8	67.9	27.2	73.8
3	051-2	73.15	79.25	6.10	23.9	24.3	26.1	66.2	28.5	72.1
3	051-2	79.25	85.34	6.10	23.1	23.4	25.2	66.4	28.5	72.4
3	051-2	85.34	91.44	6.10	26.6	26.1	30.1	68.9	27.0	75.1
3	051-2	91.44	97.54	6.10	22.9	23.1	24.4	64.2	31.2	70.5
3	051-2	97.54	103.63	6.10	25.9	25.5	29.9	70.7	24.3	76.4
3	051-2	103.63	109.73	6.10	25.3	25.4	28.9	69.8	25.4	75.7
3	051-2	109.73	115.82	6.10	23.3	23.4	27.3	72.3	22.2	77.8
3	051-2	115.82	121.92	6.10	24.2	24.2	29.1	74.6	20.0	79.9
3	051-2	121.92	128.02	6.10	21.1	21.6	24.9	72.9	21.4	78.2
3	051-2	128.02	134.11	6.10	21.2	21.5	24.5	70.9	24.2	76.6
3	051-2	134.11	140.21	6.10	21.3	21.0	26.9	78.3	17.9	83.9
3	051-2	140.21	146.30	6.10	23.7	23.4	28.0	73.0	22.0	78.6
3	051-2	146.30	152.40	6.10	25.2	25.4	29.8	72.8	22.5	78.5
3	051-2	152.40	158.50	6.10	26.0	25.4	29.3	68.8	26.2	74.6
3	051-2	158.50	164.59	6.10	21.9	21.9	24.9	69.5	25.4	75.3
3	051-2	164.59	170.69	6.10	15.9	15.6	17.5	67.9	24.5	72.7
3	051-2	170.69	176.78	6.10	20.2	21.0	25.1	76.8	18.5	82.3
3	051-2	176.78	182.88	6.10	22.1	22.5	26.2	73.3	21.2	78.6
3	051-2	182.88	188.98	6.10	20.8	21.3	23.3	68.9	25.0	74.3
3	051-2	188.98	195.07	6.10	21.9	22.5	24.2	68.0	25.4	73.3
3	051-2	195.07	201.17	6.10	20.1	20.7	23.5	72.4	21.3	77.5
3	051-2	201.17	207.26	6.10	26.7	26.3	32.6	75.2	20.7	81.0
3	051-2	207.26	213.36	6.10	21.1	21.8	24.6	72.1	22.4	77.5
3	051-2	213.36	219.46	6.10	19.8	20.0	22.3	69.6	24.1	74.9
3	051-2	219.46	225.55	6.10	18.1	17.9	20.6	70.3	23.3	75.5
3	051-2	225.55	228.60	3.05	29.3	29.4	36.6	76.7	19.9	82.7
3	051-2	228.60	234.70	6.10	27.3	27.3	34.1	77.2	18.5	82.8
3	051-2	234.70	240.79	6.10	13.6	13.8	13.7	62.2	28.6	66.9
3	051-2	240.79	246.89	6.10	17.8	17.9	19.1	66.2	26.4	71.3
3	051-2	246.89	252.98	6.10	11.0	10.7	10.8	62.5	23.4	65.1
3	051-2	252.98	259.08	6.10	21.5	21.0	23.9	68.3	26.2	73.9
3	051-2	259.08	265.18	6.10	26.5	26.1	30.4	70.1	25.7	76.2
3	051-2	265.18	271.27	6.10	25.1	25.5	27.1	65.8	28.7	71.6
3	051-2	294.74	300.23	5.49	37.1	36.3	46.4	76.5	21.3	82.9
3	051-2	300.23	302.36	2.13	37.7	37.8	48.8	79.8	17.7	85.9
3	051-2	302.97	309.07	6.10	44.0	43.7	61.3	86.2	12.3	92.2
3	051-2	309.07	315.16	6.10	38.7	38.4	52.5	83.9	14.3	90.0

3	051-2	315.16	320.65	5.49	34.8	34.7	46.5	82.7	15.1	88.7
3	051-2	321.36	326.14	4.57	26.9	27.0	34.8	80.1	16.5	85.8
1	01-14	3759.10	640.08	672.02		180.00	-60.00			
2	01-14	60.96	180.0	-63.00						
2	01-14	121.92	180.0	-60.00						
2	01-14	160.02	180.0	-60.00						
3	01-14	53.95	60.96	7.01	33.4	33.1	44.3	82.6	13.6	88.0
3	01-14	60.96	67.06	6.10	35.5	36.3	48.2	84.7	12.1	90.1
3	01-14	67.06	73.15	6.10	36.5	36.5	50.4	86.3	10.3	91.5
3	01-14	73.15	79.25	6.10	32.8	33.2	45.3	86.0	11.0	91.5
3	01-14	79.25	85.34	6.10	31.2	33.0	41.0	81.9	14.1	87.2
3	01-14	85.34	91.44	6.10	21.5	21.5	27.0	78.7	14.9	83.3
3	01-14	91.44	97.54	6.10	21.4	22.3	27.9	81.2	14.1	86.3
3	01-14	97.54	103.63	6.10	15.3	15.2	17.7	73.0	17.6	76.8
3	01-14	109.73	115.82	6.10	30.6	32.3	41.1	83.8	12.6	89.1
3	01-14	115.82	121.92	6.10	27.3	27.0	34.4	78.6	16.0	83.6
3	01-14	121.92	128.02	6.10	31.6	32.6	40.6	79.5	16.5	85.0
3	01-14	128.02	134.11	6.10	32.6	33.0	41.8	79.8	15.3	84.9
3	01-14	134.11	140.21	6.10	32.2	32.7	39.4	75.8	18.9	81.1
3	01-14	140.21	146.30	6.10	18.8	19.3	22.3	74.0	19.4	78.8
3	01-14	146.30	152.40	6.10	17.2	16.5	19.8	72.4	18.9	76.5
1	01-15	3759.10	335.28	716.71		180.00	-45.00			
2	01-15	60.96	180.0	-45.00						
2	01-15	121.92	180.0	-45.00						
3	01-15	16.76	22.86	6.10	20.8	21.0	25.3	76.0	17.2	80.6
3	01-15	22.86	28.96	6.10	31.9	34.6	42.9	84.3	11.4	89.3
3	01-15	28.96	35.05	6.10	33.9	38.6	44.8	82.2	14.1	87.7
3	01-15	35.05	41.15	6.10	37.8	38.3	50.9	83.8	13.3	89.4
3	01-15	41.15	44.20	3.05	43.3	43.2	59.6	85.5	11.8	91.1
3	01-15	46.94	53.34	6.40	32.6	33.9	40.6	77.4	17.6	82.6
1	08-09	3759.10	-76.20	788.27		180.00	-85.00			
3	08-09	4.57	10.67	6.10	16.9	17.5	18.9	69.6	21.9	74.0
3	08-09	10.67	16.76	6.10	15.5	17.5	17.2	69.2	21.5	73.3
3	08-09	16.76	22.86	6.10	17.8	18.2	19.6	68.8	22.1	73.0
3	08-09	41.15	47.24	6.10	21.0	22.0	24.9	73.8	19.7	78.7
3	08-09	47.24	53.34	6.10	17.3	16.9	19.5	70.5	20.9	74.8
3	08-09	53.34	59.44	6.10	19.3	20.2	22.4	71.9	21.4	76.9
3	08-09	59.44	65.53	6.10	18.6	19.8	20.4	67.5	26.0	72.8
3	08-09	65.53	71.63	6.10	18.0	18.6	20.1	69.0	24.0	74.0
3	08-09	71.63	77.72	6.10	19.6	20.2	23.6	74.9	19.2	79.9
3	08-09	77.72	79.55	1.83	18.4	18.3	19.0	63.9	27.0	68.4
1	24-08	3759.10	521.09	687.32		180.00	-50.00			
2	24-08	60.96	180.0	-46.00						
2	24-08	121.92	180.0	-45.00						
2	24-08	160.02	180.0	-44.00						
3	24-08	31.70	37.80	6.10	14.2	15.0	16.2	71.0	20.5	75.3
3	24-08	37.80	39.93	2.13	17.2	17.9	21.1	77.2	15.5	81.5
3	24-08	43.28	48.77	5.49	29.2	29.1	37.1	79.2	15.8	84.3
3	24-08	48.77	54.86	6.10	26.0	26.0	32.0	76.3	18.1	81.4
3	24-08	54.86	60.96	6.10	30.3	30.5	38.9	79.8	15.9	85.2

3	24-08	60.96	67.06	6.10	34.0	34.3	43.8	80.0	16.0	85.5
3	24-08	67.06	70.71	3.66	24.6	24.1	29.6	74.7	19.2	79.8
3	24-08	70.71	76.50	5.79	27.3	26.5	32.4	73.6	20.5	78.7
3	24-08	99.97	101.80	1.83	20.4	20.1	24.1	73.7	18.8	78.2
3	24-08	105.46	108.20	2.74	18.2	18.7	22.3	77.2	15.1	81.4
3	24-08	108.20	112.17	3.96	12.1	11.9	13.1	69.7	17.3	72.3
3	24-08	112.17	115.82	3.66	18.1	18.1	20.7	71.6	19.3	75.6
3	24-08	115.82	121.92	6.10	16.7	16.3	18.9	71.3	19.0	75.1
3	24-08	121.92	128.02	6.10	20.5	20.5	24.6	75.0	17.3	79.3
3	24-08	128.02	132.89	4.88	19.8	19.4	22.9	72.6	19.3	76.9
3	24-08	134.11	141.43	7.32	21.4	22.2	25.9	76.0	16.2	80.3
3	24-08	142.34	148.74	6.40	19.9	19.8	23.7	74.3	18.1	78.7
3	24-08	148.74	152.40	3.66	17.6	17.7	19.2	68.5	21.7	72.4
3	24-08	152.40	158.50	6.10	27.6	27.4	34.7	78.5	16.4	83.6
3	24-08	158.50	164.90	6.40	37.5	36.8	47.4	78.4	17.3	83.8
3	24-08	167.03	170.69	3.66	41.5	42.6	54.0	81.1	14.2	86.3
3	24-08	170.69	177.09	6.40	34.5	35.6	43.8	79.2	14.9	84.0
1	27-02	3759.10	0.00	797.66	180.00	-70.00				
2	27-02	30.48	180.0	-63.75						
2	27-02	60.96	180.0	-62.50						
2	27-02	121.92	180.0	-60.00						
2	27-02	182.88	180.0	-57.50						
2	27-02	243.84	180.0	-52.50						
2	27-02	304.80	180.0	-55.75						
2	27-02	365.76	180.0	-59.00						
2	27-02	426.72	180.0	-59.00						
2	27-02	468.78	180.0	-61.25						
3	27-02	2.13	8.23	6.10	36.8	37.2	47.6	79.7	17.7	85.8
3	27-02	8.23	14.33	6.10	26.0	26.4	31.9	75.8	19.8	81.4
3	27-02	14.33	20.42	6.10	21.2	21.4	24.7	71.9	22.3	77.2
3	27-02	20.42	26.52	6.10	18.8	18.4	22.8	74.9	20.2	80.4
3	27-02	26.52	32.61	6.10	25.3	25.2	28.9	70.0	25.5	75.9
3	27-02	32.61	38.71	6.10	20.0	20.1	21.3	65.5	27.5	70.7
3	27-02	38.71	44.81	6.10	26.7	26.7	32.1	73.9	21.5	79.6
3	27-02	44.81	50.90	6.10	22.0	21.8	26.2	73.8	20.3	78.9
3	27-02	50.90	57.00	6.10	22.3	22.5	26.0	71.9	22.2	77.2
3	27-02	57.00	63.09	6.10	25.3	25.5	29.6	72.3	21.9	77.6
3	27-02	63.09	69.19	6.10	22.0	22.3	26.1	73.5	20.9	78.8
3	27-02	69.19	75.29	6.10	21.1	21.5	23.8	69.6	23.9	74.8
3	27-02	75.29	81.38	6.10	19.3	19.4	21.3	68.3	24.1	73.2
3	27-02	81.38	87.48	6.10	15.9	15.9	18.0	70.6	21.7	75.2
3	27-02	87.48	90.83	3.35	18.2	18.4	20.1	68.8	22.9	73.3
3	27-02	103.63	109.73	6.10	22.3	22.7	28.5	79.3	16.1	84.5
3	27-02	109.73	115.82	6.10	21.7	22.0	25.6	73.0	21.9	78.5
3	27-02	115.82	121.92	6.10	21.9	22.2	26.3	74.1	21.2	79.7
3	27-02	121.92	128.02	6.10	19.1	19.7	22.2	71.7	22.4	76.9
3	27-02	128.02	134.11	6.10	23.6	23.7	29.6	77.4	18.8	83.0
3	27-02	134.11	140.21	6.10	27.9	28.6	36.0	79.7	17.2	85.5
3	27-02	140.21	145.08	4.88	26.4	26.9	31.2	72.0	24.3	78.1
3	27-02	146.61	152.70	6.10	22.8	23.1	27.6	74.7	20.9	80.4

3	27-02	152.70	158.80	6.10	24.7	25.0	28.5	71.0	23.2	76.4	
3	27-02	158.80	164.90	6.10	28.1	28.4	34.4	75.5	20.6	81.3	
3	27-02	164.90	170.99	6.10	27.0	27.8	33.8	77.4	18.4	83.0	
3	27-02	170.99	177.09	6.10	23.6	24.0	28.0	73.0	21.7	78.5	
3	27-02	177.09	180.44	3.35	24.4	24.7	27.2	67.9	27.0	73.9	
3	27-02	185.62	191.72	6.10	23.5	23.5	25.5	66.2	28.8	72.2	
3	27-02	191.72	197.82	6.10	15.8	15.8	18.5	72.5	21.2	77.6	
3	27-02	197.82	203.91	6.10	19.7	20.0	23.2	72.2	23.1	78.0	
3	27-02	203.91	210.01	6.10	21.2	21.0	25.6	74.4	21.0	80.0	
3	27-02	210.01	216.10	6.10	16.1	16.4	19.3	74.8	18.9	79.7	
3	27-02	216.10	222.20	6.10	21.9	22.2	26.2	73.8	21.3	79.3	
3	27-02	222.20	228.30	6.10	21.3	21.1	25.1	72.4	22.6	78.0	
3	27-02	228.30	234.39	6.10	26.4	26.3	32.3	75.2	20.7	81.0	
3	27-02	234.39	240.49	6.10	21.3	21.4	25.8	74.8	20.3	80.3	
3	27-02	240.49	246.58	6.10	24.5	24.8	29.6	74.2	21.4	79.9	
3	27-02	246.58	252.68	6.10	24.3	24.4	28.8	72.6	23.2	78.5	
3	27-02	252.68	258.78	6.10	37.4	36.4	49.3	81.2	16.5	87.3	
3	27-02	258.78	264.87	6.10	28.5	28.1	35.4	76.6	19.4	82.3	
3	27-02	264.87	270.97	6.10	33.5	33.8	43.1	79.4	17.5	85.3	
3	27-02	270.97	280.11	9.14	20.3	20.7	24.5	74.5	20.7	80.0	
3	27-02	280.11	286.21	6.10	17.9	18.2	20.8	71.4	23.4	77.0	
3	27-02	286.21	292.30	6.10	33.0	32.4	42.2	78.7	18.6	84.8	
3	27-02	292.30	298.40	6.10	28.4	27.5	34.7	75.0	21.8	81.2	
3	27-02	298.40	304.19	5.79	22.1	21.6	25.9	72.2	22.5	77.7	
3	27-02	304.19	306.32	2.13	7.2	7.3	5.7	51.7	27.5	52.5	
3	27-02	306.32	312.42	6.10	15.8	15.3	18.0	70.7	22.4	75.6	
3	27-02	312.42	318.52	6.10	22.6	21.8	27.5	75.2	19.7	80.6	
3	27-02	318.52	324.61	6.10	27.7	27.7	34.9	77.8	18.1	83.5	
3	27-02	324.61	330.71	6.10	32.7	33.0	40.8	76.9	19.5	82.8	
3	27-02	330.71	336.80	6.10	33.7	33.2	42.5	77.8	18.6	83.6	
3	27-02	336.80	342.90	6.10	33.8	34.0	41.6	75.9	20.4	81.7	
3	27-02	342.90	349.00	6.10	39.9	40.2	52.3	80.9	16.3	86.8	
3	27-02	349.00	355.09	6.10	37.7	38.1	49.3	80.8	16.2	86.6	
3	27-02	355.09	361.19	6.10	29.5	30.2	37.1	77.4	19.3	83.3	
3	27-02	361.19	367.28	6.10	39.0	39.2	50.7	80.4	16.7	86.2	
3	27-02	367.28	373.38	6.10	39.3	39.2	49.7	77.6	19.8	83.8	
3	27-02	373.38	379.48	6.10	36.8	37.0	45.2	75.2	21.8	81.4	
3	27-02	379.48	382.83	3.35	34.6	33.1	41.4	73.5	22.3	79.3	
3	27-02	393.80	399.90	6.10	43.8	43.9	57.0	80.1	17.7	86.3	
3	27-02	399.90	405.99	6.10	26.1	26.2	31.0	72.8	22.6	78.5	
3	27-02	405.99	412.09	6.10	26.5	26.2	31.0	71.6	24.0	77.6	
3	27-02	412.09	418.19	6.10	40.2	39.1	55.1	85.0	12.7	90.8	
3	27-02	418.19	424.28	6.10	32.4	33.3	42.2	80.3	16.9	86.2	
3	27-02	424.28	430.38	6.10	34.3	34.3	40.1	71.4	24.7	77.5	
3	27-02	430.38	436.47	6.10	36.2	36.4	44.1	74.4	22.7	80.7	
3	27-02	436.47	438.61	2.13	12.8	13.0	14.1	68.8	21.1	72.7	
2	28-04	3759.10	822.96	660.50		180.00	-50.00				
2	28-04	60.96	180.0	-47.50							
2	28-04	121.92	180.0	-45.00							
2	28-04	182.88	180.0	-41.50							

2	28-04	243.84		180.0	-39.00						
2	28-04	304.80		180.0	-44.00						
2	28-04	365.76		180.0	-39.00						
2	28-04	426.72		180.0	-39.00						
3	28-04	178.31	184.40	6.10	27.3	27.1	33.8	76.4	19.5	82.1	
3	28-04	184.40	190.50	6.10	34.7	34.2	46.5	83.2	13.8	88.9	
3	28-04	190.50	196.60	6.10	34.6	35.6	46.7	84.0	12.9	89.6	
3	28-04	196.60	203.61	7.01	26.1	25.9	33.4	79.5	16.1	84.8	
3	28-04	207.26	213.36	6.10	23.0	22.5	28.7	77.9	16.2	82.8	
3	28-04	213.36	219.15	5.79	16.7	16.7	19.1	71.1	21.0	75.6	
3	28-04	223.11	228.60	5.49	29.8	30.6	38.6	80.4	15.8	85.9	
3	28-04	228.60	234.70	6.10	23.2	23.1	27.8	74.0	20.7	79.4	
3	28-04	234.70	240.79	6.10	31.9	32.0	41.5	80.8	15.3	86.2	
3	28-04	240.79	246.89	6.10	36.5	36.6	47.6	80.7	16.1	86.5	
3	28-04	246.89	252.98	6.10	37.0	37.4	45.9	76.6	19.5	82.3	
3	28-04	252.98	259.08	6.10	21.3	21.5	25.0	73.0	19.8	77.7	
3	28-04	259.08	265.18	6.10	24.1	24.4	28.8	74.1	19.6	79.1	
3	28-04	265.18	268.53	3.35	19.7	19.7	22.3	70.1	22.6	75.0	
3	28-04	270.36	270.97	0.61	19.1	18.5	21.0	67.7	25.3	72.8	
3	28-04	272.19	273.41	1.22	16.6	17.0	19.8	75.0	17.4	79.3	
3	28-04	282.85	290.47	7.62	22.8	22.5	28.5	77.9	16.4	82.8	
3	28-04	290.47	296.57	6.10	25.4	25.3	31.4	76.4	18.7	81.8	
3	28-04	296.57	300.84	4.27	34.3	34.7	39.8	71.5	23.0	76.9	
3	28-04	302.06	307.85	5.79	25.6	25.5	31.4	76.4	17.9	81.4	
3	28-04	307.85	313.94	6.10	27.2	27.3	35.0	80.2	15.1	85.4	
3	28-04	313.94	320.04	6.10	23.1	23.3	27.4	74.2	18.4	78.8	
3	28-04	320.04	323.39	3.35	25.1	25.4	31.1	76.6	18.5	81.9	
3	28-04	324.31	326.14	1.83	36.4	36.0	47.8	81.2	16.1	87.1	
3	28-04	333.45	339.55	6.10	30.2	30.3	39.6	81.5	14.9	87.0	
3	28-04	354.18	356.62	2.44	29.1	0.0	38.3	81.9	14.0	87.2	
1	30-03	3759.10	-304.80	787.91	180.00	-52.00					
2	30-03	60.96		180.0	-50.00						
2	30-03	121.92		180.0	-50.00						
2	30-03	182.88		180.0	-52.00						
3	30-03	99.06	106.68	7.62	28.8	29.5	38.9	84.1	12.8	89.6	
3	30-03	106.68	112.78	6.10	24.2	24.6	28.8	73.6	21.4	79.1	
3	30-03	112.78	115.82	3.05	33.7	34.4	45.2	83.3	13.8	89.0	
3	30-03	146.30	152.40	6.10	40.0	41.0	57.0	88.4	10.1	94.3	
3	30-03	152.40	158.50	6.10	51.9	52.4	70.3	83.1	16.3	89.7	
3	30-03	158.50	164.59	6.10	68.1	68.0	91.8	82.5	17.4	89.4	
3	30-03	179.22	186.54	7.32	44.8	45.4	61.1	84.3	14.1	90.4	
3	30-03	202.08	207.26	5.18	35.7	36.6	45.8	78.9	18.3	84.9	
3	30-03	207.26	213.36	6.10	42.7	43.0	58.3	84.5	13.3	90.4	
3	30-03	213.36	219.46	6.10	35.3	35.9	44.2	77.4	18.8	83.1	
3	30-03	219.46	224.03	4.57	35.5	35.1	46.2	80.4	16.6	86.2	
0	31-01	3759.10	-487.68	764.13	180.00	-45.00					
0	32-01	3759.10	-152.40	786.38	180.00	-55.00					
0	32-01	60.96		180.0	-52.00						
0	32-01	121.92		180.0	-52.50						
0	32-01	182.88		180.0	-53.00						

0	33-04	3759.10	152.40	749.81	180.00	-60.00				
0	33-04	60.96	180.0	-58.00						
0	33-04	121.92	180.0	-57.00						
0	33-04	182.88	180.0	-55.00						
0	33-04	243.84	180.0	-55.00						
1	051-1	3759.10	350.00	710.50	190.35	-65.00				
2	051-1	20.50	190.35	-67.00						
2	051-1	20.50	190.35	-61.00						
2	051-1	20.50	190.35	-52.00						
2	051-1	20.50	190.35	-51.00						
2	051-1	20.50	190.35	-47.00						
2	051-1	20.50	190.35	-47.00						
2	051-1	20.50	190.35	-48.00						
3	051-1	22.86	25.30	2.44	16.0	16.4	18.0	70.0	21.7	74.5
3	051-1	26.21	30.48	4.27	18.0	17.9	20.4	70.8	20.4	75.0
3	051-1	30.48	36.58	6.10	16.1	16.2	18.2	70.7	20.1	74.7
3	051-1	36.58	42.67	6.10	17.0	16.7	20.4	75.8	15.2	79.6
3	051-1	42.67	48.77	6.10	14.4	14.6	16.1	69.8	21.1	73.9
3	051-1	49.99	54.86	4.88	22.5	22.7	27.5	76.0	18.1	81.0
3	051-1	54.86	60.96	6.10	19.0	18.9	21.2	70.0	20.4	73.9
3	051-1	60.96	67.06	6.10	34.4	33.8	42.5	77.2	16.7	82.0
3	051-1	67.06	73.15	6.10	36.2	36.2	42.1	71.5	23.2	77.0
3	051-1	73.15	79.25	6.10	32.2	31.8	41.0	79.2	15.9	84.4
3	051-1	79.25	85.34	6.10	21.6	21.5	26.2	75.2	19.4	80.4
3	051-1	85.34	91.44	6.10	13.4	13.4	14.5	69.8	15.1	71.6
3	051-1	171.30	173.74	2.44	14.9	15.0	16.4	69.1	21.8	73.2
3	051-1	173.74	179.83	6.10	39.0	38.3	51.4	82.0	14.7	87.6
3	051-1	179.83	185.93	6.10	37.0	37.1	47.1	79.2	16.3	84.5
3	051-1	185.93	192.02	6.10	37.9	38.0	49.1	80.4	15.8	85.9
3	051-1	192.02	198.12	6.10	26.6	26.4	30.9	71.6	23.1	77.1
3	051-1	198.12	204.22	6.10	25.3	25.7	25.4	60.8	32.7	66.6
3	051-1	204.22	210.31	6.10	17.2	16.8	18.5	67.3	22.5	71.2
3	051-1	210.31	216.41	6.10	34.1	33.9	43.8	79.7	16.5	85.2
3	051-1	216.41	220.98	4.57	36.6	36.0	41.7	69.6	25.6	75.4
3	051-1	235.61	240.79	5.18	30.8	30.5	40.0	80.9	14.2	85.9
3	051-1	240.79	246.89	6.10	30.9	30.6	38.5	77.3	18.3	82.8
3	051-1	246.89	252.98	6.10	24.8	25.2	30.1	75.3	19.0	80.4
3	051-1	252.98	259.08	6.10	35.6	35.6	44.7	77.4	18.9	83.2
3	051-1	259.08	262.13	3.05	32.8	32.4	41.4	77.9	18.6	83.7
3	051-1	262.13	268.22	6.10	38.8	38.7	50.5	80.4	16.3	86.1
3	051-1	268.22	274.32	6.10	34.3	34.4	45.8	83.1	13.7	88.7
3	051-1	274.32	280.42	6.10	32.3	31.8	40.6	77.8	18.2	83.4
3	051-1	280.42	286.51	6.10	27.9	28.1	35.4	78.8	17.0	84.3
3	051-1	286.51	292.61	6.10	20.1	20.3	24.5	75.8	18.4	80.8
3	051-1	292.61	298.70	6.10	18.5	18.3	21.7	73.4	19.2	78.0
3	051-1	298.70	304.80	6.10	18.9	19.1	23.6	77.3	18.1	82.7
3	051-1	304.80	310.90	6.10	12.4	13.1	14.0	70.7	21.1	75.2
3	051-1	310.90	316.99	6.10	27.6	27.5	35.9	80.8	15.5	86.4
3	051-1	316.99	323.09	6.10	33.0	33.0	43.5	81.4	15.5	87.2
3	051-1	323.09	329.18	6.10	11.3	11.4	12.6	69.9	20.5	73.9

3	051-1	329.18	335.28	6.10	18.1	18.3	21.6	74.4	19.4	79.4
3	051-1	335.28	340.77	5.49	31.2	31.4	39.3	77.5	19.6	83.6
3	051-1	341.99	347.47	5.49	32.5	33.0	41.4	78.6	18.5	84.6
3	051-1	355.70	360.27	4.57	35.4	35.4	47.9	83.6	14.1	89.6
3	051-1	368.81	370.94	2.13	38.6	38.4	55.0	88.6	10.0	94.5
3	051-1	399.29	406.91	7.62	16.4	16.4	17.9	66.0	28.7	72.0
3	051-1	420.93	421.54	0.61	49.6	49.2	71.0	88.7	10.5	94.9
1	049-2	3915.30	335.00	721.00		130.0	-50.00			
2	049-2	50.00	130.0	-46.00						
2	049-2	100.00	130.0	-47.00						
2	049-2	150.00	130.0	-44.00						
2	049-2	200.00	130.0	-42.00						
2	049-2	250.00	130.0	-41.00						
2	049-2	300.00	130.0	-38.00						
2	049-2	350.00	130.0	-39.00						
2	049-2	400.00	130.0	-37.00						
2	049-2	450.00	130.0	-37.00						
2	049-2	550.00	130.0	-47.00						
2	049-2	600.00	130.0	-50.00						
3	049-2	14.94	18.29	3.35	35.6	35.5	45.5	79.3	16.6	84.8
3	049-2	18.29	21.34	3.05	35.7	35.8	45.9	80.0	15.3	85.3
3	049-2	21.34	24.38	3.05	38.5	38.8	49.9	80.0	16.6	85.8
3	049-2	24.38	27.43	3.05	33.1	33.1	42.3	79.0	17.4	84.7
3	049-2	27.43	30.48	3.05	20.0	19.8	22.6	69.9	22.6	74.7
3	049-2	30.48	33.53	3.05	23.8	23.6	28.4	74.5	18.5	79.2
3	049-2	33.53	36.58	3.05	22.2	21.2	26.6	74.9	17.9	79.5
3	049-2	36.58	39.62	3.05	19.5	18.9	22.9	73.5	19.3	78.1
3	049-2	39.62	42.67	3.05	12.6	12.5	12.4	63.0	22.2	65.3
3	049-2	42.67	45.11	2.44	16.9	16.8	20.2	75.4	14.8	78.9
3	049-2	85.34	88.39	3.05	18.4	17.6	21.0	71.6	19.0	75.5
3	049-2	88.39	91.44	3.05	21.4	20.9	23.1	66.4	26.6	71.6
3	049-2	91.44	97.54	6.10	33.2	34.9	44.0	82.5	13.9	87.9
3	049-2	97.54	101.80	4.27	36.9	36.5	49.3	83.2	13.2	88.5
3	049-2	202.69	207.26	4.57	34.9	34.6	45.3	80.5	15.7	86.0
3	049-2	207.26	213.36	6.10	37.6	37.3	50.0	82.5	14.3	88.1
3	049-2	213.36	219.46	6.10	38.8	38.8	52.7	84.6	12.6	90.2
3	049-2	219.46	225.55	6.10	36.3	36.5	46.9	80.2	16.3	85.8
3	049-2	225.55	231.65	6.10	36.4	36.7	48.3	82.3	14.3	87.8
3	049-2	231.65	235.31	3.66	41.2	41.6	56.3	84.7	12.9	90.5
3	049-2	249.94	256.03	6.10	34.5	34.9	44.4	80.1	15.1	85.3
3	049-2	256.03	262.13	6.10	38.8	39.1	52.4	84.0	12.8	89.5
3	049-2	262.13	268.22	6.10	38.9	39.8	53.4	85.4	11.7	90.9
3	049-2	268.22	274.32	6.10	32.5	32.6	45.6	87.7	9.0	93.0
3	049-2	274.32	280.42	6.10	37.6	36.5	53.3	88.4	9.4	94.1
3	049-2	280.42	286.51	6.10	23.2	23.6	29.7	80.1	14.3	84.9
3	049-2	286.51	292.61	6.10	17.6	17.9	22.1	78.9	13.5	83.0
3	049-2	292.61	298.70	6.10	25.5	25.9	33.8	83.1	11.9	87.9
3	049-2	298.70	304.80	6.10	32.9	32.8	46.2	87.4	9.9	93.0
3	049-2	304.80	310.90	6.10	32.6	32.6	46.5	89.1	8.6	94.7
3	049-2	310.90	316.99	6.10	31.2	31.1	42.2	84.0	12.8	89.6

3	049-2	316.99	322.48	5.49	39.2	39.1	54.4	86.2	11.5	91.9
3	049-2	335.58	341.38	5.79	24.6	25.3	33.4	85.0	10.9	90.1
3	049-2	341.38	347.47	6.10	29.5	28.3	40.8	86.1	11.1	91.7
3	049-2	347.47	353.57	6.10	23.8	24.5	30.3	78.9	16.8	84.3
3	049-2	353.57	359.36	5.79	29.1	29.3	36.5	77.2	19.5	83.1
3	049-2	364.24	365.76	1.52	30.2	28.4	40.0	82.2	14.3	87.7
3	049-2	365.76	371.86	6.10	28.1	27.7	37.3	82.5	14.2	88.1
3	049-2	377.95	384.05	6.10	36.3	36.5	51.5	88.1	10.6	94.1
3	049-2	390.14	396.24	6.10	39.8	39.8	56.7	88.4	10.5	94.4
3	049-2	396.24	402.34	6.10	32.1	32.5	44.1	85.7	11.1	91.1
3	049-2	402.34	408.43	6.10	27.5	27.4	36.0	81.7	14.1	86.9
3	049-2	408.43	414.53	6.10	28.2	28.0	36.8	81.3	14.1	86.5
3	049-2	414.53	420.62	6.10	11.6	11.0	12.9	70.4	17.7	73.4
3	049-2	420.62	426.72	6.10	24.8	24.4	31.2	78.5	15.6	83.3
3	049-2	426.72	432.82	6.10	22.3	22.7	26.3	73.3	19.7	78.1
3	049-2	432.82	438.91	6.10	24.7	24.2	31.6	80.1	14.4	84.9
3	049-2	438.91	445.01	6.10	30.3	29.0	40.9	84.0	12.5	89.4
3	049-2	445.01	451.10	6.10	29.4	29.0	38.4	81.0	14.8	86.4
3	049-2	451.10	457.20	6.10	26.9	27.1	31.6	72.9	20.7	77.9
3	049-2	457.20	463.30	6.10	30.3	29.6	37.2	76.2	18.4	81.3
3	049-2	463.30	469.39	6.10	34.1	33.2	44.7	81.6	14.8	87.1
3	049-2	469.39	475.49	6.10	35.0	34.7	45.7	81.3	14.7	86.7
3	049-2	475.49	481.58	6.10	37.4	37.3	49.4	82.0	14.4	87.4
3	049-2	481.58	487.68	6.10	38.1	38.2	51.7	85.1	9.9	89.8
3	049-2	487.68	493.78	6.10	35.0	35.3	45.8	81.6	13.5	86.6
3	049-2	493.78	499.87	6.10	36.1	36.4	48.6	84.3	11.1	89.3
3	049-2	499.87	505.97	6.10	36.3	35.9	47.2	81.0	14.6	86.3
3	049-2	505.97	512.06	6.10	29.6	29.8	37.5	78.4	18.0	84.2
3	049-2	512.06	518.16	6.10	34.2	34.0	44.0	79.5	17.5	85.4
3	049-2	518.16	520.60	2.44	36.6	37.0	45.9	77.1	19.8	83.1
3	049-2	525.78	530.35	4.57	36.8	37.1	46.3	77.7	18.6	83.4
3	049-2	530.35	533.70	3.35	26.5	27.1	35.1	83.1	11.6	87.8
3	049-2	541.32	542.54	1.22	16.4	16.8	18.7	72.4	17.0	75.7
3	049-2	542.54	548.64	6.10	43.4	43.3	62.2	89.3	9.1	95.1
3	049-2	548.64	554.74	6.10	42.5	42.5	58.3	85.1	12.8	90.9
3	049-2	554.74	560.83	6.10	32.8	32.9	41.6	79.2	15.5	84.2
3	049-2	560.83	566.93	6.10	38.7	38.3	52.4	84.3	12.8	89.9
3	049-2	566.93	573.02	6.10	34.3	34.6	43.7	78.3	18.8	84.3
3	049-2	573.02	574.24	1.22	18.3	18.8	22.6	77.6	14.2	81.5
1	035-1	3915.30	-304.80	764.10	180.0	-65.00				
2	035-1	60.96	180.0	-65.00						
2	035-1	121.92	180.0	-70.00						
2	035-1	182.88	180.0	-69.00						
3	035-1	9.45	12.19	2.74	31.8	32.1	36.2	69.6	25.7	75.5
3	035-1	12.19	18.29	6.10	24.2	24.5	27.6	69.6	25.5	75.4
3	035-1	18.29	24.38	6.10	37.7	37.7	46.6	75.3	22.5	81.8
3	035-1	24.38	30.48	6.10	41.8	41.9	53.3	78.3	19.7	84.6
3	035-1	30.48	36.58	6.10	43.0	43.9	58.3	83.5	15.4	89.9
3	035-1	36.58	42.67	6.10	27.9	28.3	32.6	71.2	25.3	77.5
3	035-1	42.67	48.77	6.10	36.9	37.1	51.1	85.5	13.5	91.8

3	035-1	48.77	54.86	6.10	32.7	32.8	45.5	86.4	11.4	92.1
3	035-1	54.86	60.96	6.10	39.4	40.2	54.3	85.2	13.3	91.2
3	035-1	60.96	67.06	6.10	12.3	12.6	14.6	74.1	18.7	78.7
3	035-1	67.06	73.15	6.10	47.0	47.1	59.1	76.3	23.0	83.3
3	035-1	73.15	79.25	6.10	58.3	58.6	76.2	79.7	19.9	86.6
3	035-1	79.25	85.34	6.10	25.7	26.6	31.7	75.6	21.8	81.9
3	035-1	85.34	91.44	6.10	33.9	34.7	42.5	77.1	19.9	83.2
3	035-1	91.44	97.54	6.10	46.8	47.1	61.0	80.3	17.6	86.5
3	035-1	97.54	103.63	6.10	46.1	46.2	59.1	78.8	18.8	85.0
3	035-1	103.63	109.73	6.10	41.7	43.6	56.7	84.3	13.5	90.2
3	035-1	128.02	134.11	6.10	44.4	44.3	61.3	85.1	14.2	91.6
3	035-1	134.11	140.21	6.10	40.3	40.6	56.7	87.0	12.0	93.2
3	035-1	140.21	146.30	6.10	34.7	35.0	46.6	83.1	14.6	89.0
3	035-1	146.30	152.40	6.10	41.7	42.1	59.7	88.9	10.1	94.9
3	035-1	152.40	158.50	6.10	33.0	33.9	45.5	85.4	12.4	91.2
3	035-1	158.50	164.59	6.10	44.9	44.8	62.1	85.5	13.2	91.7
3	035-1	164.59	170.69	6.10	54.4	54.3	75.5	85.4	14.2	92.0
3	035-1	170.69	176.78	6.10	49.9	49.6	66.2	81.4	17.5	87.9
3	035-1	176.78	182.88	6.10	43.6	43.7	56.9	80.1	18.2	86.5
3	035-1	182.88	184.40	1.52	20.9	20.0	24.7	72.5	23.4	78.4
1	26-06	3915.30	-243.84	768.70		180.0	-45.00			
2	26-06	60.96	180.0	-46.00						
2	26-06	121.92	180.0	-44.00						
2	26-06	182.88	180.0	-58.00						
2	26-06	243.84	180.0	-55.00						
3	26-06	5.79	12.19	6.40	28.3	27.9	34.4	75.2	19.6	80.5
3	26-06	12.19	18.29	6.10	32.9	32.3	42.8	80.8	15.5	86.3
3	26-06	18.29	24.38	6.10	22.6	21.8	26.8	73.8	19.3	78.6
3	26-06	24.38	30.48	6.10	26.6	26.9	34.3	80.6	14.1	85.5
3	26-06	30.48	36.58	6.10	29.9	30.5	40.5	84.3	12.5	89.8
3	26-06	36.58	42.67	6.10	35.0	34.9	47.5	84.6	12.4	90.1
3	26-06	42.67	48.77	6.10	35.5	35.8	49.0	85.8	11.8	91.5
3	26-06	48.77	54.86	6.10	29.9	29.5	40.3	84.2	12.1	89.5
3	26-06	91.44	97.54	6.10	43.7	45.0	62.7	89.3	9.5	95.2
3	26-06	97.54	99.97	2.44	33.0	34.1	44.2	83.1	14.0	88.8
3	26-06	103.63	109.73	6.10	46.1	46.1	56.8	75.0	23.2	81.8
3	26-06	109.73	115.82	6.10	57.3	57.8	76.7	82.2	16.9	88.8
3	26-06	128.02	134.11	6.10	50.4	50.3	66.1	80.9	16.9	87.0
3	26-06	140.21	146.30	6.10	49.5	49.5	68.5	85.8	12.5	91.7
3	26-06	170.69	176.78	6.10	34.3	35.2	47.0	85.3	12.1	90.9
3	26-06	176.78	182.88	6.10	27.2	27.5	36.0	81.9	15.6	87.9
3	26-06	201.17	207.26	6.10	48.8	49.2	68.4	86.8	11.9	92.9
3	26-06	207.26	213.36	6.10	51.4	51.2	72.4	87.2	11.8	93.4
3	26-06	213.36	219.46	6.10	33.9	34.0	41.6	75.9	19.6	81.5
1	27-01	3915.30	-30.48	804.67		180.0	-63.00			
2	27-01	60.96	180.0	-55.00						
2	27-01	121.92	180.0	-56.25						
2	27-01	182.88	180.0	-52.00						
2	27-01	243.84	180.0	-46.00						
2	27-01	304.80	180.0	-45.00						

2	27-01	365.76		180.0	-46.00						
2	27-01	426.72		180.0	-50.25						
2	27-01	484.02		180.0	-51.50						
3	27-01	2.44	8.53	6.10	38.2	38.2	49.4	80.1	16.7	85.8	
3	27-01	8.53	14.63	6.10	38.9	38.2	50.7	80.6	16.3	86.3	
3	27-01	14.63	20.73	6.10	38.0	37.7	49.9	81.2	16.0	87.1	
3	27-01	20.73	26.82	6.10	31.8	31.9	41.1	79.9	16.8	85.6	
3	27-01	26.82	32.92	6.10	29.3	29.3	38.9	82.1	15.1	87.9	
3	27-01	32.92	39.01	6.10	31.2	31.0	40.1	79.3	17.6	85.1	
3	27-01	39.01	45.11	6.10	20.7	20.8	21.4	63.2	29.8	68.6	
3	27-01	45.11	51.21	6.10	19.8	19.8	20.0	61.9	29.8	66.9	
3	27-01	51.21	57.30	6.10	12.8	12.7	12.8	63.3	23.2	66.1	
3	27-01	57.30	63.40	6.10	21.5	21.4	24.7	71.0	22.9	76.2	
3	27-01	63.40	69.49	6.10	14.0	13.9	14.7	66.4	21.4	69.5	
3	27-01	69.49	75.59	6.10	18.2	17.9	20.1	68.9	22.7	73.4	
3	27-01	75.59	81.69	6.10	20.2	20.5	23.7	72.7	21.3	77.8	
3	27-01	81.69	87.78	6.10	28.7	28.6	38.6	83.6	13.2	89.1	
3	27-01	87.78	93.88	6.10	30.1	30.2	39.3	80.7	16.0	86.4	
3	27-01	93.88	99.97	6.10	32.8	32.8	40.7	76.3	19.9	82.1	
3	27-01	99.97	106.07	6.10	40.1	40.1	52.8	81.6	15.4	87.3	
3	27-01	106.07	112.17	6.10	33.0	32.8	43.1	80.7	16.1	86.5	
3	27-01	112.17	118.26	6.10	31.2	31.0	39.4	78.0	18.3	83.8	
3	27-01	118.26	124.36	6.10	16.5	16.5	18.1	69.1	21.5	73.1	
3	27-01	154.84	160.93	6.10	15.6	15.7	17.5	70.7	20.0	74.7	
3	27-01	160.93	167.03	6.10	23.5	23.5	28.0	73.9	20.3	79.0	
3	27-01	167.03	173.13	6.10	20.0	19.8	22.0	67.3	26.2	72.6	
3	27-01	173.13	179.22	6.10	24.7	25.1	32.2	80.8	16.0	86.5	
3	27-01	179.22	182.88	3.66	32.7	32.8	42.9	81.4	15.5	87.1	
3	27-01	182.88	188.98	6.10	30.6	30.7	37.8	76.2	19.8	81.9	
3	27-01	188.98	195.07	6.10	21.5	21.6	23.8	68.2	25.0	73.4	
3	27-01	195.07	201.17	6.10	20.8	18.9	20.2	58.7	34.2	64.4	
3	27-01	201.17	204.22	3.05	15.9	15.7	17.5	68.4	23.4	73.0	
3	27-01	204.22	210.31	6.10	35.3	35.1	43.4	76.0	19.7	81.6	
3	27-01	210.31	216.41	6.10	35.2	35.0	44.4	77.9	18.6	83.6	
3	27-01	216.41	222.50	6.10	36.8	36.9	46.7	78.3	18.5	84.3	
3	27-01	222.50	225.55	3.05	28.1	28.1	33.9	74.4	21.3	80.1	
3	27-01	225.55	231.65	6.10	18.3	18.5	19.5	65.6	26.7	70.6	
3	27-01	231.65	234.70	3.05	24.2	24.1	29.1	74.2	21.0	79.7	
3	27-01	234.70	240.79	6.10	23.3	23.4	27.4	72.4	22.3	77.9	
3	27-01	240.79	246.89	6.10	24.7	24.8	29.9	74.7	20.9	80.4	
3	27-01	246.89	252.98	6.10	14.9	15.0	15.0	62.6	27.5	67.0	
3	27-01	252.98	259.08	6.10	21.7	21.7	24.3	69.1	24.4	74.3	
3	27-01	259.08	265.18	6.10	34.5	34.7	43.6	77.8	19.3	83.8	
3	27-01	265.18	271.27	6.10	34.8	35.0	43.8	77.5	19.3	83.5	
3	27-01	271.27	277.37	6.10	30.3	30.4	37.7	76.7	19.1	82.3	
3	27-01	277.37	283.46	6.10	22.8	22.9	26.5	71.4	23.2	76.9	
3	27-01	294.13	300.23	6.10	27.5	27.8	34.9	78.3	18.0	84.0	
3	27-01	300.23	306.32	6.10	39.6	39.2	54.1	84.3	14.4	90.6	
3	27-01	306.32	312.42	6.10	35.2	35.2	47.6	83.9	13.9	89.8	
3	27-01	312.42	318.52	6.10	28.3	28.4	35.7	78.0	18.3	83.7	

3	27-01	318.52	324.61	6.10	30.6	30.8	39.2	79.1	17.6	84.9
3	27-01	324.61	330.71	6.10	30.9	31.4	41.6	83.1	14.9	89.2
3	27-01	330.71	336.80	6.10	33.6	33.4	44.2	81.2	16.2	87.1
3	27-01	336.80	342.90	6.10	38.8	38.6	50.4	80.1	17.7	86.3
3	27-01	342.90	349.00	6.10	44.4	44.6	61.5	85.6	13.2	91.8
3	27-01	349.00	355.09	6.10	44.8	45.1	62.4	86.0	12.8	92.2
3	27-01	355.09	361.19	6.10	42.6	42.8	58.5	85.1	13.4	91.2
3	27-01	361.19	367.28	6.10	45.0	45.1	61.4	84.1	14.7	90.5
3	27-01	367.28	373.38	6.10	58.7	58.2	82.6	87.0	12.6	93.4
3	27-01	373.38	379.48	6.10	38.5	38.9	49.6	79.4	17.9	85.4
3	27-01	379.48	385.57	6.10	44.3	44.6	59.8	83.4	14.7	89.4
3	27-01	385.57	389.84	4.27	17.6	17.5	14.1	49.0	38.7	53.3
3	27-01	389.84	392.89	3.05	12.9	12.8	7.9	39.0	40.1	40.6
3	27-01	392.89	397.76	4.88	30.7	30.7	37.8	75.7	20.3	81.5
3	27-01	397.76	403.86	6.10	38.4	38.5	47.8	76.1	21.8	82.5
3	27-01	403.86	407.82	3.96	40.5	40.8	53.0	80.3	13.1	86.8
3	27-01	410.57	412.09	1.52	44.6	44.7	57.6	78.9	20.1	85.6
3	27-01	413.00	419.10	6.10	44.7	44.5	59.6	81.8	17.5	88.5
3	27-01	419.10	424.89	5.79	40.1	40.1	51.3	78.4	19.3	84.7
1	042-3	4067.70	-87.78	780.00	180.0	-52.00				
2	042-3	60.96	180.0	-46.00						
3	042-3	10.67	16.76	6.10	31.2	30.8	40.2	79.9	16.4	85.5
3	042-3	16.76	22.86	6.10	35.6	35.0	45.4	79.1	17.1	84.7
3	042-3	22.86	28.96	6.10	38.6	37.7	51.8	83.3	14.1	89.1
3	042-3	28.96	35.05	6.10	38.0	38.0	48.3	78.4	18.3	84.3
3	042-3	35.05	39.62	4.57	32.6	29.5	37.7	71.4	22.8	76.7
3	042-3	53.64	59.74	6.10	46.9	46.3	65.0	85.7	12.9	91.8
3	042-3	59.74	65.84	6.10	59.2	59.2	84.3	88.1	11.5	94.4
3	042-3	65.84	71.93	6.10	40.1	39.8	54.7	84.6	13.0	90.4
3	042-3	71.93	78.03	6.10	38.3	37.9	53.1	86.2	11.6	92.0
3	042-3	78.03	84.12	6.10	38.1	37.1	50.1	81.5	15.8	87.4
3	042-3	84.12	87.48	3.35	34.8	33.9	44.4	79.2	17.0	84.8
1	048-2	4067.70	-38.00	780.30	130.0	-55.00				
2	048-2	50.00	130.0	-52.50						
2	048-2	100.00	130.0	-52.00						
2	048-2	150.00	130.0	-52.50						
2	048-2	200.00	130.0	-54.00						
2	048-2	250.00	130.0	-52.00						
3	048-2	0.00	4.57	4.57	39.4	40.1	54.5	86.5	10.0	91.7
3	048-2	4.57	9.14	4.57	38.9	38.8	53.5	85.7	11.6	91.2
3	048-2	9.14	13.72	4.57	35.5	35.8	46.5	81.6	14.1	86.9
3	048-2	13.72	18.29	4.57	30.8	31.4	39.7	80.9	13.2	85.6
3	048-2	18.29	24.38	6.10	34.9	34.6	45.1	80.6	15.1	85.9
3	048-2	24.38	30.48	6.10	34.2	34.3	43.5	79.1	16.4	84.4
3	048-2	30.48	36.58	6.10	36.6	36.5	44.7	75.1	21.2	81.0
3	048-2	36.58	42.67	6.10	39.6	39.7	52.8	82.8	13.9	88.3
3	048-2	42.67	48.77	6.10	36.0	35.5	45.6	78.6	17.2	84.1
3	048-2	48.77	54.86	6.10	29.2	29.6	35.9	76.2	18.4	81.4
3	048-2	54.86	60.96	6.10	19.0	19.2	15.7	52.0	32.8	55.0
3	048-2	60.96	67.06	6.10	45.1	45.1	63.0	86.6	12.0	92.?

3	048-2	67.06	73.15	6.10	49.3	49.2	72.6	91.6	7.6	97.6
3	048-2	73.15	79.25	6.10	50.9	51.0	76.5	93.8	5.5	99.6
3	048-2	79.25	85.34	6.10	35.7	36.1	50.7	88.6	9.2	94.2
3	048-2	85.34	91.44	6.10	29.1	28.9	37.5	80.2	14.9	85.3
3	048-2	124.97	131.06	6.10	25.6	25.9	32.1	78.0	16.9	83.2
3	048-2	131.06	137.16	6.10	41.7	41.9	56.7	84.2	13.8	90.2
3	048-2	137.16	143.26	6.10	44.2	44.6	63.5	89.2	9.9	95.3
3	048-2	143.26	149.35	6.10	57.0	56.1	85.9	93.9	5.9	99.9
3	048-2	149.35	155.45	6.10	61.6	60.8	92.5	93.4	6.4	99.4
3	048-2	155.45	161.54	6.10	55.5	54.5	81.5	91.3	8.3	97.4
3	048-2	161.54	167.64	6.10	49.5	49.5	70.6	88.1	11.4	94.5
3	048-2	167.64	173.74	6.10	48.3	47.5	69.7	89.8	8.8	95.7
3	048-2	173.74	179.83	6.10	27.8	27.1	39.3	88.1	9.6	93.7
3	048-2	179.83	185.93	6.10	19.6	19.4	26.2	83.4	12.0	88.4
3	048-2	185.93	192.02	6.10	9.1	7.7	5.5	39.9	36.6	40.4
3	048-2	192.02	198.12	6.10	22.7	23.3	31.5	86.4	10.6	91.8
3	048-2	198.12	204.22	6.10	34.5	34.2	46.7	84.0	13.1	89.6
3	048-2	204.22	207.26	3.05	22.6	21.5	28.6	79.4	14.7	84.1
3	048-2	260.60	266.70	6.10	22.2	22.7	29.5	83.1	12.1	88.0
3	048-2	266.70	272.80	6.10	28.1	28.1	37.7	84.1	11.3	89.1
3	048-2	284.99	291.08	6.10	51.6	50.5	73.9	89.1	9.6	94.9
1	51-3A	4067.70	400.00	697.00		130.0	-60.00			
2	51-3A	25.00	130.0	-58.00						
2	51-3A	50.00	130.0	-57.00						
2	51-3A	100.00	130.0	-55.00						
2	51-3A	150.00	130.0	-54.00						
2	51-3A	200.00	130.0	-53.00						
2	51-3A	250.00	130.0	-51.00						
2	51-3A	300.00	130.0	-48.00						
2	51-3A	350.00	130.0	-44.00						
2	51-3A	400.00	130.0	-42.00						
2	51-3A	450.00	130.0	-36.00						
2	51-3A	500.00	130.0	-24.00						
2	51-3A	550.00	130.0	-23.00						
2	51-3A	582.00	130.0	-16.00						
3	51-3A	24.38	29.87	5.49	20.5	20.8	25.2	77.0	16.3	81.6
3	51-3A	85.34	91.44	6.10	33.6	34.0	42.5	78.4	17.4	83.9
3	51-3A	91.44	94.49	3.05	30.0	30.1	39.3	81.5	14.4	86.9
3	51-3A	94.49	100.58	6.10	29.3	29.6	39.0	82.9	12.8	88.1
3	51-3A	100.58	106.68	6.10	27.2	27.3	35.2	80.9	13.6	85.8
3	51-3A	106.68	112.78	6.10	17.4	17.2	21.0	75.6	17.2	80.0
3	51-3A	112.78	118.87	6.10	24.5	24.6	32.0	81.5	13.9	86.6
3	51-3A	118.87	124.97	6.10	20.5	21.0	25.5	77.6	16.0	82.3
3	51-3A	124.97	131.06	6.10	34.5	34.1	45.7	82.2	14.5	87.8
3	51-3A	131.06	137.16	6.10	26.4	27.0	33.5	79.1	15.4	84.1
3	51-3A	137.16	143.26	6.10	21.1	21.6	26.3	78.1	15.5	82.7
3	51-3A	143.26	149.35	6.10	19.7	19.9	21.5	68.8	20.4	72.3
3	51-3A	149.35	155.45	6.10	32.5	32.2	40.2	76.7	18.3	82.0
3	51-3A	155.45	162.46	7.01	36.1	36.4	46.7	80.3	15.5	85.7
3	51-3A	167.34	173.74	6.40	28.8	29.0	35.0	75.3	19.2	80.6

3	51-3A	173.74	179.83	6.10	28.8	28.6	35.0	75.2	19.4	80.4
3	51-3A	243.84	249.94	6.10	18.2	18.3	21.2	72.7	19.3	77.1
3	51-3A	249.94	256.03	6.10	30.4	30.7	39.6	81.2	14.1	86.3
3	51-3A	256.03	262.13	6.10	30.0	29.8	40.2	83.3	12.9	88.7
3	51-3A	262.13	268.22	6.10	40.6	40.9	54.8	83.7	13.6	89.4
3	51-3A	268.22	274.32	6.10	31.5	31.7	39.5	77.5	18.4	83.1
1	00016	3915.30	107.29	776.30	180.0	-45.00				
3	00016	1.83	7.62	5.79	24.7	24.5	28.9	72.3	21.3	77.4
3	00016	7.62	13.72	6.10	25.1	25.3	30.3	74.7	20.0	80.0
3	00016	13.72	19.81	6.10	33.5	33.4	41.7	76.6	20.1	82.6
3	00016	19.81	27.13	7.32	36.6	36.7	44.2	73.8	23.1	80.1
3	00016	30.18	37.49	7.32	32.1	32.4	37.3	70.8	25.7	77.1
3	00016	40.23	47.24	7.01	37.5	37.3	41.9	67.9	28.0	74.2
3	00016	47.24	53.34	6.10	35.6	35.6	38.9	66.2	29.3	72.5
3	00016	53.34	59.44	6.10	38.2	37.8	46.6	74.5	22.7	80.8
3	00016	59.44	68.88	9.45	20.7	20.4	21.7	64.3	28.3	69.5
3	00016	68.88	77.72	8.84	32.1	32.2	40.6	77.9	18.9	83.8
3	00016	77.72	86.87	9.14	27.1	28.3	31.2	70.7	24.1	76.3
3	00016	86.87	92.96	6.10	37.1	37.1	47.5	78.7	19.0	84.9
3	00016	96.01	102.11	6.10	43.9	43.7	58.6	82.0	16.7	88.5
3	00016	102.11	108.20	6.10	39.0	38.7	51.3	81.2	16.5	87.3
3	00016	108.20	114.30	6.10	37.2	37.3	49.0	81.4	15.9	87.3
3	00016	114.30	120.40	6.10	36.4	36.1	50.1	85.2	13.2	91.2
3	00016	120.40	126.49	6.10	38.6	38.1	52.5	84.5	13.1	90.3
3	00016	126.49	131.67	5.18	38.4	37.9	51.3	82.7	14.6	88.5
1	048-3	4067.70	194.00	742.80	130.0	-55.00				
2	048-3	50.00	130.0	-50.00						
2	048-3	100.00	130.0	-50.00						
2	048-3	150.00	130.0	-49.00						
2	048-3	200.00	130.0	-44.00						
2	048-3	250.00	130.0	-47.00						
2	048-3	300.00	130.0	-43.00						
2	048-3	350.00	130.0	-40.00						
2	048-3	400.00	130.0	-43.00						
2	048-3	450.00	130.0	-42.00						
2	048-3	500.00	130.0	-44.00						
3	048-3	3.66	6.10	2.44	38.5	38.5	51.9	83.8	13.3	89.4
3	048-3	6.10	9.14	3.05	35.8	35.6	46.6	80.8	15.6	86.3
3	048-3	9.14	12.19	3.05	37.7	37.5	51.4	84.6	12.8	90.4
3	048-3	12.19	15.24	3.05	21.2	21.1	23.8	69.3	24.1	74.5
3	048-3	15.24	18.29	3.05	34.0	33.8	45.1	82.2	15.2	88.1
3	048-3	18.29	21.34	3.05	31.9	31.3	42.3	82.4	14.1	87.9
3	048-3	21.34	24.38	3.05	35.1	34.4	44.3	78.1	17.9	83.7
3	048-3	24.38	28.04	3.66	28.5	28.4	36.0	78.7	16.3	83.8
3	048-3	77.42	79.25	1.83	18.7	18.6	23.8	80.0	13.2	84.4
3	048-3	79.25	85.34	6.10	28.4	28.5	37.6	82.9	12.5	87.9
3	048-3	85.34	91.44	6.10	33.8	33.4	45.9	84.8	11.6	90.1
3	048-3	91.44	97.54	6.10	39.6	39.6	55.1	86.7	10.7	92.3
3	048-3	97.54	103.63	6.10	31.5	31.6	41.9	82.8	13.1	88.0
3	048-3	103.63	109.73	6.10	33.4	32.9	40.9	75.8	19.4	81.3

3	048-3	109.73	115.82	6.10	32.2	32.3	41.2	79.3	16.4	84.7
3	048-3	241.71	243.84	2.13	37.9	37.0	50.1	81.9	15.4	87.8
3	048-3	243.84	249.94	6.10	39.3	39.0	51.2	80.6	16.1	86.4
3	048-3	249.94	256.03	6.10	38.0	37.6	49.7	81.3	15.2	86.8
3	048-3	256.03	262.13	6.10	39.8	39.7	54.6	85.5	11.3	90.9
3	048-3	262.13	268.22	6.10	39.6	40.0	54.8	86.1	11.3	91.7
3	048-3	268.22	274.32	6.10	39.1	39.0	49.7	78.1	19.6	84.4
3	048-3	274.32	280.42	6.10	20.8	21.0	23.1	67.9	26.7	73.6
3	048-3	280.42	286.51	6.10	47.0	48.3	65.0	85.6	12.9	91.7
3	048-3	286.51	292.61	6.10	43.0	41.8	49.6	69.4	28.7	76.4
3	048-3	292.61	298.70	6.10	40.1	40.5	56.3	87.5	10.4	93.2
3	048-3	298.70	304.80	6.10	36.7	37.4	52.4	89.2	8.7	94.8
3	048-3	304.80	310.90	6.10	25.5	25.4	31.8	77.1	18.9	82.7
3	048-3	310.90	316.99	6.10	19.6	20.2	24.1	76.9	16.8	81.6
3	048-3	316.99	323.09	6.10	31.5	32.0	39.1	76.0	21.3	82.3
3	048-3	323.09	329.18	6.10	10.6	10.7	6.9	42.3	35.3	43.0
3	048-3	329.18	335.28	6.10	27.8	28.3	36.5	81.8	14.5	87.3
3	048-3	341.38	347.47	6.10	29.7	29.3	41.8	87.8	9.8	93.3
3	048-3	347.47	353.57	6.10	30.3	30.1	42.4	87.5	9.4	92.8
3	048-3	353.57	359.66	6.10	28.7	28.4	39.0	84.6	12.1	90.0
3	048-3	359.66	365.76	6.10	49.9	50.0	71.2	88.5	10.5	94.6
3	048-3	365.76	371.86	6.10	40.7	39.9	57.8	88.3	10.1	94.1
3	048-3	371.86	377.95	6.10	41.7	41.2	57.0	84.6	13.5	90.6
3	048-3	377.95	384.05	6.10	42.7	42.3	59.8	86.7	11.9	92.7
3	048-3	384.05	390.14	6.10	41.0	40.6	56.1	84.6	13.9	90.8
3	048-3	390.14	396.24	6.10	40.7	40.5	57.3	87.6	10.8	93.5
3	048-3	396.24	402.34	6.10	47.8	48.3	69.4	90.3	8.5	96.1
3	048-3	402.34	408.43	6.10	47.0	46.8	68.5	90.8	8.3	96.7
3	048-3	408.43	414.53	6.10	51.1	51.0	72.5	87.8	11.4	94.0
3	048-3	414.53	420.62	6.10	45.0	45.3	65.0	89.8	8.9	95.7
3	048-3	420.62	426.72	6.10	40.2	39.9	59.3	92.4	5.9	97.9
3	048-3	426.72	432.82	6.10	42.8	42.9	62.3	90.8	7.7	96.5
3	048-3	432.82	438.91	6.10	54.2	54.2	78.9	90.5	8.8	96.6
3	048-3	438.91	445.01	6.10	54.2	54.4	77.9	89.1	10.1	95.2
3	048-3	445.01	450.80	5.79	34.1	34.1	45.4	82.7	13.9	88.3
3	048-3	457.50	462.08	4.57	33.5	33.8	44.8	83.2	13.5	88.7
3	048-3	470.61	475.49	4.88	36.6	37.0	49.0	82.8	15.0	88.8
3	048-3	475.49	481.58	6.10	44.4	44.4	64.4	90.2	8.5	96.0
3	048-3	481.58	487.68	6.10	47.3	47.9	66.7	87.4	11.4	93.5
3	048-3	487.68	493.78	6.10	39.1	39.3	51.5	81.7	15.2	87.4
3	048-3	493.78	499.87	6.10	40.2	40.2	55.2	85.3	12.5	91.1
3	048-3	499.87	505.97	6.10	40.7	40.3	57.4	87.7	10.3	93.5
3	048-3	505.97	508.71	2.74	22.7	23.1	27.6	75.4	19.0	80.6

APPENDIX 3

Drill hole sample coordinates (geographic and stratigraphic) and values

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
41-2A	-528.78	810.96	3000.00	-1431.77	561.26	3.66	37.90	50.40
41-2A	-532.10	807.40	3000.00	-1434.14	557.87	6.10	5.80	5.90
41-2A	-540.00	798.92	3000.00	-1438.31	549.71	1.22	37.10	49.10
41-2A	-541.77	797.03	3000.00	-1439.60	547.83	.91	42.80	58.90
41-2A	-547.48	790.90	3000.00	-1443.75	541.77	6.10	43.40	57.60
41-2A	-551.64	786.44	3000.00	-1446.77	537.35	6.10	45.20	61.70
41-2A	-555.80	781.98	3000.00	-1449.80	532.94	6.10	38.60	53.10
41-2A	-560.11	777.68	3000.00	-1453.07	528.49	6.10	27.40	37.30
41-2A	-564.23	773.83	3000.00	-1456.31	524.34	5.18	43.10	60.80
41-2A	-568.58	769.78	3000.00	-1459.74	519.97	6.71	35.20	48.60
41-2A	-572.81	765.83	3000.00	-1463.06	515.72	2.44	31.70	43.80
41-2A	-578.16	760.84	3000.00	-1467.27	510.34	6.10	33.40	43.20
41-2A	-582.62	756.68	3000.00	-1470.78	505.86	6.10	39.00	51.70
41-2A	-585.63	753.87	3000.00	-1473.15	502.83	2.13	37.30	49.60
10-02	-449.25	792.05	3000.00	-1330.91	597.92	6.10	34.80	45.60
10-02	-453.17	787.38	3000.00	-1333.57	593.70	6.10	33.30	46.70
10-02	-457.09	782.71	3000.00	-1336.23	589.49	6.10	37.70	52.90
10-02	-461.01	778.04	3000.00	-1338.88	585.28	6.10	46.80	69.40
035-5	-341.30	810.15	3000.00	-1204.61	714.32	1.83	19.20	24.60
035-5	-343.58	806.91	3000.00	-1203.94	713.37	6.10	36.30	51.20
035-5	-347.07	801.92	3000.00	-1202.88	711.92	6.10	32.50	44.00
035-5	-350.57	796.92	3000.00	-1224.83	700.72	6.10	32.10	41.80
035-5	-354.06	791.93	3000.00	-1217.98	701.24	6.10	28.80	34.80
035-5	-369.36	770.08	3000.00	-1228.11	666.49	1.52	31.60	37.50
035-5	-370.76	768.09	3000.00	-1229.32	662.50	3.35	32.70	40.20
035-5	-375.39	761.86	3000.00	-1233.44	649.66	3.66	24.80	31.10
035-5	-393.04	742.26	3000.00	-1244.35	613.47	1.52	32.10	44.20
035-5	-395.59	739.43	3000.00	-1252.15	599.90	6.10	20.40	26.50
035-5	-399.66	734.90	3000.00	-1253.71	595.54	6.10	18.50	23.50
035-5	-403.74	730.37	3000.00	-1255.88	592.12	6.10	35.70	51.20
035-5	-407.82	725.84	3000.00	-1258.05	588.70	6.10	47.10	68.00
035-5	-411.90	721.31	3000.00	-1260.22	585.28	6.10	57.70	84.50
035-5	-420.06	712.25	3000.00	-1264.66	578.11	6.10	62.30	91.20
035-5	-424.14	707.72	3000.00	-1264.21	575.41	6.10	50.10	72.80
035-5	-428.22	703.19	3000.00	-1266.38	572.00	6.10	37.70	51.00
035-5	-432.29	698.66	3000.00	-1261.96	570.31	6.10	35.10	48.20
035-5	-436.38	694.13	3000.00	-1264.07	567.05	6.10	39.90	55.40
035-5	-440.45	689.60	3000.00	-1264.89	564.23	6.10	43.00	61.00
035-5	-444.53	685.07	3000.00	-1267.44	560.67	6.10	40.90	55.00
035-5	-448.61	680.54	3000.00	-1270.00	557.10	6.10	40.30	57.60
035-5	-452.69	676.01	3000.00	-1267.69	554.19	6.10	39.50	52.90
035-5	-456.65	671.37	3000.00	-1269.77	550.96	6.10	36.90	48.80
035-5	-460.49	666.64	3000.00	-1271.59	547.81	6.10	33.40	41.60
035-5	-464.32	661.90	3000.00	-1273.40	544.66	6.10	39.80	55.00
035-5	-468.16	657.16	3000.00	-1276.46	540.81	6.10	32.10	43.20
035-5	-471.99	652.43	3000.00	-1279.09	537.21	6.10	47.40	68.90

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
035-5	-475.83	647.69	3000.00	-1281.72	533.60	6.10	31.50	42.10
035-5	-479.67	642.95	3000.00	-1284.36	529.99	6.10	26.20	34.50
035-5	-487.34	633.48	3000.00	-1289.62	522.79	6.10	32.80	43.00
035-5	-491.17	628.74	3000.00	-1297.41	515.85	6.10	28.30	37.10
035-5	-495.15	624.12	3000.00	-1299.92	512.29	6.10	33.10	43.40
035-5	-499.27	619.63	3000.00	-1302.75	508.64	6.10	34.80	45.10
035-5	-503.39	615.13	3000.00	-1305.56	504.98	6.10	32.40	43.60
10-03	-263.11	775.92	3000.00	-1042.19	759.20	6.10	21.80	27.20
10-03	-266.94	771.18	3000.00	-1045.08	756.39	6.10	18.60	25.00
10-03	-270.78	766.44	3000.00	-1047.99	753.57	6.10	22.60	29.70
10-03	-274.62	761.70	3000.00	-1050.90	750.76	6.10	16.40	17.70
10-03	-278.45	756.97	3000.00	-1053.87	747.91	6.10	23.10	28.80
10-03	-282.29	752.23	3000.00	-1058.03	744.61	6.10	29.90	42.20
10-03	-286.13	747.49	3000.00	-1062.18	741.31	6.10	27.10	40.20
10-03	-289.96	742.76	3000.00	-1066.32	738.02	6.10	32.20	40.40
10-03	-296.96	734.11	3000.00	-1073.88	732.01	4.57	26.10	38.00
10-03	-308.72	719.12	3000.00	-1083.90	722.65	6.10	31.00	42.80
10-03	-312.48	714.32	3000.00	-1088.47	719.14	6.10	27.30	34.60
10-03	-316.23	709.51	3000.00	-1083.32	718.58	6.10	23.70	32.80
10-03	-319.98	704.71	3000.00	-1087.51	715.15	6.10	37.60	49.00
10-03	-323.73	699.91	3000.00	-1091.69	711.73	6.10	45.30	65.30
10-03	-327.49	695.10	3000.00	-1095.89	708.29	6.10	46.20	65.30
10-03	-331.24	690.30	3000.00	-1100.07	704.87	6.10	38.90	51.00
10-03	-334.99	685.49	3000.00	-1098.41	704.03	6.10	40.80	54.50
10-03	-337.90	681.77	3000.00	-1101.95	701.23	3.35	28.90	38.60
10-03	-355.92	658.71	3000.00	-1113.98	654.78	1.52	44.40	61.90
10-04	-183.34	731.52	3000.00	-866.37	933.16	6.10	21.90	28.40
10-04	-186.39	726.24	3000.00	-875.47	912.60	6.10	20.40	22.00
10-04	-189.43	720.96	3000.00	-883.78	798.62	6.10	26.80	32.60
10-04	-192.48	715.69	3000.00	-886.88	795.30	6.10	19.30	23.00
10-04	-195.53	710.40	3000.00	-885.36	792.23	6.10	19.60	21.30
10-04	-198.62	705.15	3000.00	-888.95	788.92	6.10	22.20	26.00
10-04	-201.76	699.93	3000.00	-892.77	785.40	6.10	21.60	27.10
10-04	-204.90	694.70	3000.00	-890.32	781.92	6.10	21.20	24.70
10-04	-211.50	683.73	3000.00	-898.24	774.87	4.88	34.90	47.20
10-04	-214.09	679.42	3000.00	-902.88	772.00	5.18	28.90	39.40
10-04	-238.26	639.18	3000.00	-931.68	743.56	4.57	27.60	37.70
10-04	-251.21	617.63	3000.00	-949.17	728.03	6.10	32.90	45.70
10-04	-253.88	613.19	3000.00	-952.78	724.83	4.27	34.30	48.30
045-3	-116.56	670.44	3000.00	-749.11	953.42	3.05	27.80	36.20
045-3	-117.80	667.65	3000.00	-753.86	943.95	3.05	25.90	34.10
045-3	-119.04	664.87	3000.00	-758.59	934.50	3.05	6.60	5.60
045-3	-120.28	662.09	3000.00	-772.41	911.91	3.05	21.60	27.00
045-3	-121.58	659.16	3000.00	-775.98	901.60	3.35	22.20	27.70
045-3	-122.82	656.38	3000.00	-775.44	884.32	2.74	19.20	21.50
045-3	-125.23	650.95	3000.00	-775.33	873.53	3.05	5.70	4.60

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
045-3	-126.48	648.16	3000.00	-773.53	798.34	3.05	23.40	28.00
045-3	-127.72	645.38	3000.00	-775.39	796.42	3.05	22.50	26.60
045-3	-128.96	642.59	3000.00	-777.25	794.50	3.05	24.50	31.50
045-3	-130.20	639.81	3000.00	-779.11	792.59	3.05	18.40	23.80
045-3	-131.43	637.03	3000.00	-780.96	790.68	3.05	24.30	29.60
045-3	-132.67	634.24	3000.00	-782.82	788.76	3.05	23.20	30.40
045-3	-133.91	631.46	3000.00	-784.68	786.84	3.05	21.10	25.30
045-3	-135.16	628.67	3000.00	-786.56	784.92	3.05	17.70	21.40
045-3	-136.39	625.89	3000.00	-788.41	783.01	3.05	19.00	23.10
045-3	-137.63	623.11	3000.00	-790.27	781.10	3.05	22.80	27.70
045-3	-138.87	620.32	3000.00	-792.13	779.18	3.05	22.30	31.40
045-3	-140.11	617.53	3000.00	-794.00	777.26	3.05	29.20	38.30
045-3	-141.35	614.75	3000.00	-795.86	775.34	3.05	18.40	22.40
045-3	-142.59	611.97	3000.00	-797.72	773.43	3.05	23.20	30.00
045-3	-143.83	609.18	3000.00	-799.58	771.51	3.05	18.40	22.90
045-3	-145.07	606.40	3000.00	-801.97	769.41	3.05	12.30	12.20
045-3	-146.31	603.61	3000.00	-803.97	767.41	3.05	16.00	17.90
045-3	-147.55	600.82	3000.00	-805.98	765.40	3.05	23.40	29.70
045-3	-148.79	598.04	3000.00	-807.99	763.40	3.05	18.90	23.70
045-3	-150.03	595.26	3000.00	-809.98	761.40	3.05	14.10	15.60
045-3	-151.27	592.47	3000.00	-811.98	759.39	3.05	26.50	35.60
045-3	-152.51	589.69	3000.00	-813.98	757.39	3.05	23.20	29.70
045-3	-153.75	586.90	3000.00	-815.98	755.39	3.05	19.00	23.00
045-3	-154.99	584.12	3000.00	-817.98	753.38	3.05	13.50	16.50
045-3	-156.85	579.95	3000.00	-820.98	750.38	6.10	15.70	17.60
045-3	-159.33	574.37	3000.00	-824.98	746.37	6.10	20.50	24.00
045-3	-161.81	568.80	3000.00	-828.48	742.50	6.10	18.10	21.80
045-3	-164.29	563.24	3000.00	-832.31	738.64	6.10	14.40	15.50
045-3	-166.77	557.67	3000.00	-836.14	734.78	6.10	14.20	16.20
045-3	-169.25	552.10	3000.00	-839.97	730.91	6.10	27.30	35.80
045-3	-171.73	546.53	3000.00	-843.81	727.05	6.10	22.80	27.70
045-3	-174.21	540.96	3000.00	-847.64	723.19	6.10	27.50	34.00
045-3	-176.69	535.39	3000.00	-850.36	719.79	6.10	31.30	42.20
045-3	-179.16	529.82	3000.00	-853.83	716.19	6.10	22.80	27.80
045-3	-181.64	524.26	3000.00	-857.31	712.59	6.10	19.20	21.30
045-3	-184.03	519.49	3000.00	-863.75	707.57	4.57	18.50	23.20
045-3	-195.08	500.35	3000.00	-875.20	682.42	6.10	18.90	21.10
045-3	-198.12	495.07	3000.00	-877.16	669.27	6.10	26.00	33.20
045-3	-201.17	489.79	3000.00	-879.13	656.11	6.10	26.40	35.20
045-3	-203.08	486.50	3000.00	-880.36	647.90	1.52	11.70	13.10
045-3	-217.31	462.16	3000.00	-900.39	583.19	6.10	32.90	44.70
045-3	-220.63	457.05	3000.00	-911.28	569.59	6.10	42.20	56.20
045-3	-223.95	451.94	3000.00	-919.70	559.10	6.10	38.50	53.00
045-3	-227.27	446.82	3000.00	-928.13	548.59	6.10	42.20	57.90
045-3	-230.59	441.71	3000.00	-936.55	538.09	6.10	45.20	63.10
045-3	-233.91	436.60	3000.00	-944.97	527.60	6.10	44.30	63.70

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
045-3	-237.23	431.49	3000.00	-953.39	517.10	6.10	39.20	50.80
045-3	-240.55	426.37	3000.00	-961.82	506.59	6.10	38.00	51.90
04-09	-28.15	570.77	3000.00	-619.02	957.41	6.10	18.70	24.90
04-09	-28.68	564.70	3000.00	-625.78	934.65	6.10	18.90	24.10
04-09	-30.28	546.48	3000.00	-632.71	794.00	6.10	23.10	28.90
04-09	-30.81	540.41	3000.00	-620.14	799.85	6.10	15.50	17.60
04-09	-31.34	534.33	3000.00	-624.31	794.31	6.10	18.90	25.70
04-09	-31.87	528.26	3000.00	-628.49	788.78	6.10	27.80	34.80
04-09	-32.20	524.47	3000.00	-631.09	785.33	1.52	21.70	23.00
24-03	119.85	439.97	3000.00	.00	.00	6.10	25.10	30.30
24-03	116.75	434.74	3000.00	-430.36	917.14	6.10	18.10	22.40
24-03	113.34	429.87	3000.00	-437.41	887.92	5.79	12.10	13.40
24-03	109.93	425.00	3000.00	-437.05	863.07	6.10	17.60	19.10
24-03	106.43	420.01	3000.00	-451.37	794.45	6.10	23.70	29.00
24-03	102.94	415.01	3000.00	-465.47	784.62	6.10	21.50	26.30
24-03	99.44	410.02	3000.00	-473.01	778.51	6.10	26.10	34.20
24-03	95.94	405.03	3000.00	-480.55	772.40	6.10	25.10	32.60
24-03	92.45	400.03	3000.00	-488.07	766.29	6.10	21.40	24.70
24-03	88.95	395.04	3000.00	-495.60	760.18	6.10	24.30	31.20
24-03	85.45	390.05	3000.00	-503.14	754.07	6.10	26.80	34.10
24-03	81.87	385.11	3000.00	-513.90	747.60	6.10	27.10	34.80
24-03	78.20	380.25	3000.00	-522.80	740.92	6.10	23.80	27.60
24-03	74.53	375.38	3000.00	-531.70	734.24	6.10	23.00	28.40
24-03	70.87	370.51	3000.00	-540.59	727.57	6.10	16.70	17.90
24-03	67.20	365.64	3000.00	-549.49	720.89	6.10	20.50	24.70
24-03	63.53	360.77	3000.00	-558.39	714.21	6.10	24.90	29.60
24-03	60.96	357.36	3000.00	-564.62	709.53	2.44	32.30	40.50
24-03	47.20	339.11	3000.00	-593.13	634.80	6.10	34.10	45.60
24-03	43.53	334.24	3000.00	-611.20	589.90	6.10	33.50	43.80
24-03	41.51	331.56	3000.00	-617.31	582.43	.61	36.20	47.70
24-03	34.18	321.83	3000.00	-639.47	555.35	6.10	40.40	55.20
24-03	30.51	316.96	3000.00	-650.56	541.79	6.10	44.40	59.80
24-03	26.80	311.74	3000.00	-661.95	527.66	.61	37.50	51.70
24-03	24.84	308.83	3000.00	-668.05	519.97	1.52	42.30	52.90
02-12	779.83	653.92	3000.00	1069.15	802.48	6.10	29.60	36.30
02-12	767.73	637.50	3000.00	1059.47	719.67	6.10	38.60	49.50
02-12	764.02	632.67	3000.00	1049.53	694.49	6.10	37.30	46.80
02-12	760.31	627.83	3000.00	1043.10	658.73	6.10	31.90	38.40
02-12	756.60	622.99	3000.00	1036.68	622.96	6.10	24.30	27.30
02-12	746.86	610.30	3000.00	1035.55	571.89	4.57	18.20	22.70
046-1	-612.22	828.96	3150.00	-1518.67	732.68	3.05	13.50	14.70
046-1	-613.97	826.47	3150.00	-1525.00	726.63	3.05	22.00	28.00
046-1	-615.72	823.97	3150.00	-1531.33	720.57	3.05	22.80	29.50
046-1	-618.34	820.23	3150.00	-1540.81	711.51	6.10	31.00	40.50
046-1	-621.84	815.23	3150.00	-1598.97	573.04	6.10	26.80	33.40
046-1	-624.46	811.49	3150.00	-1602.08	558.39	3.05	28.10	36.80

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
046-1	-626.21	808.99	3150.00	-1604.16	548.61	3.05	27.10	33.50
046-1	-629.27	804.62	3150.00	-1609.15	526.17	7.62	35.90	47.40
046-1	-633.64	798.38	3150.00	-1616.28	397.75	7.62	12.50	16.00
046-1	-636.26	794.64	3150.00	-1616.84	394.33	1.52	9.00	9.10
25-10	-557.15	807.74	3150.00	-1370.53	826.74	8.23	34.10	45.70
25-10	-562.00	802.89	3150.00	-1394.69	787.88	5.49	15.40	19.00
25-10	-564.80	800.09	3150.00	-1405.74	778.99	2.44	37.60	51.40
25-10	-572.67	792.22	3150.00	-1436.80	753.99	5.18	53.80	77.80
25-10	-576.66	788.23	3150.00	-1452.54	741.32	6.10	39.70	54.10
25-10	-580.97	783.92	3150.00	-1471.13	725.63	6.10	46.10	65.00
25-10	-585.28	779.61	3150.00	-1489.84	710.51	6.10	37.10	52.90
25-10	-589.59	775.30	3150.00	-1542.30	589.98	6.10	40.20	57.80
25-10	-593.90	770.99	3150.00	-1549.27	565.30	6.10	41.20	58.30
25-10	-598.21	766.68	3150.00	-1556.24	540.62	6.10	38.40	52.00
25-10	-602.52	762.37	3150.00	-1563.21	515.94	6.10	34.70	48.10
25-10	-607.37	757.52	3150.00	-1569.11	397.06	7.62	33.10	43.20
10-06	-457.20	791.26	3150.00	-1238.88	914.29	6.10	35.70	48.40
10-06	-457.20	785.16	3150.00	-1234.56	913.71	6.10	27.80	36.30
10-06	-457.20	779.21	3150.00	-1230.34	913.13	5.79	35.10	48.30
10-06	-457.33	741.57	3150.00	-1214.89	903.48	3.66	19.40	23.20
10-06	-458.17	729.57	3150.00	-1229.07	863.00	2.13	25.50	31.70
10-06	-458.37	726.68	3150.00	-1231.21	853.03	3.66	24.40	30.90
10-06	-459.67	708.13	3150.00	-1246.91	793.06	6.10	38.40	51.70
10-06	-460.11	701.75	3150.00	-1249.83	787.02	6.71	41.60	59.00
10-06	-460.60	694.75	3150.00	-1254.82	779.38	6.10	41.60	56.40
10-06	-461.03	688.67	3150.00	-1259.21	772.43	6.10	35.70	45.40
10-06	-461.51	683.06	3150.00	-1263.40	765.94	5.18	35.70	46.40
10-06	-462.26	675.93	3150.00	-1270.42	756.65	6.10	43.20	58.30
10-06	-462.90	669.87	3150.00	-1273.49	749.73	6.10	35.70	47.30
10-06	-463.53	663.81	3150.00	-1278.11	743.00	6.10	32.80	45.30
10-06	-464.17	657.74	3150.00	-1282.74	736.25	6.10	33.60	45.20
10-06	-464.81	651.68	3150.00	-1284.71	730.28	6.10	32.50	43.20
10-06	-465.45	645.62	3150.00	-1289.57	723.16	6.10	45.80	65.90
10-06	-466.08	639.55	3150.00	-1294.42	716.05	6.10	31.00	42.10
10-06	-466.72	633.49	3150.00	-1293.61	713.02	6.10	29.20	36.80
10-06	-467.42	626.83	3150.00	-1299.45	704.55	7.32	32.00	41.40
10-06	-468.07	620.15	3150.00	-1339.29	592.70	6.10	37.30	51.80
10-06	-468.60	614.07	3150.00	-1340.38	575.28	6.10	47.80	64.90
10-06	-469.13	608.00	3150.00	-1341.46	557.88	6.10	32.10	42.80
10-06	-469.98	598.29	3150.00	-1341.21	535.48	4.88	38.90	50.80
10-06	-470.92	587.51	3150.00	-1342.22	505.47	4.57	32.00	43.60
07-06	-121.33	695.04	3150.00	-748.03	1058.44	6.10	26.80	33.10
07-06	-121.02	676.75	3150.00	-743.65	1033.11	6.10	17.00	18.90
07-06	-120.96	646.27	3150.00	-739.78	995.53	6.10	16.20	3.60
07-06	-120.96	640.18	3150.00	-744.21	990.52	6.10	23.00	16.00
07-06	-120.96	634.08	3150.00	-749.33	985.07	6.10	11.90	24.90

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
07-06	-120.96	621.89	3150.00	-757.11	975.35	6.10	18.00	19.20
07-06	-120.96	615.79	3150.00	-761.15	970.60	6.10	31.60	40.00
07-06	-120.96	609.70	3150.00	-765.62	965.80	6.10	23.10	27.00
07-06	-120.80	603.60	3150.00	-770.57	960.43	6.10	30.00	38.00
07-06	-120.48	597.52	3150.00	-775.24	955.18	6.10	24.70	29.10
07-06	-120.16	591.43	3150.00	-779.91	949.91	6.10	21.70	25.70
07-06	-119.85	585.34	3150.00	-785.89	944.76	6.10	31.70	38.30
07-06	-119.53	579.26	3150.00	-790.28	939.64	6.10	19.30	21.80
07-06	-119.21	573.16	3150.00	-794.69	934.51	6.10	27.60	31.70
07-06	-118.89	567.08	3150.00	-799.08	929.39	6.10	28.00	33.60
07-06	-118.57	560.99	3150.00	-803.47	924.26	6.10	23.40	25.90
07-06	-118.25	554.90	3150.00	-806.38	918.79	6.10	28.00	28.60
07-06	-117.93	548.82	3150.00	-811.55	912.89	6.10	16.50	18.80
07-06	-117.77	542.72	3150.00	-815.85	907.89	6.10	16.00	13.10
07-06	-117.77	502.95	3150.00	-842.06	799.46	5.79	23.40	26.20
07-06	-117.77	497.00	3150.00	-846.20	792.06	6.10	27.10	30.40
07-06	-117.77	492.74	3150.00	-849.16	786.77	2.44	.00	22.20
27-10	326.73	719.14	3150.00	.00	.00	.91	21.50	21.70
27-10	326.02	717.62	3150.00	.00	.00	2.44	13.90	16.00
27-10	324.67	714.72	3150.00	.00	.00	3.96	23.90	27.10
27-10	322.54	710.16	3150.00	.00	.00	6.10	15.40	17.40
27-10	319.90	704.50	3150.00	.00	.00	6.40	19.90	23.10
27-10	317.46	699.25	3150.00	.00	.00	5.18	12.50	14.60
27-10	315.39	694.83	3150.00	.00	.00	4.57	22.40	26.50
27-10	150.36	504.02	3150.00	-413.42	1056.33	5.79	21.60	26.80
27-10	139.75	492.04	3150.00	-438.22	995.30	8.53	25.10	32.10
27-10	134.76	486.69	3150.00	-449.70	988.63	6.10	25.10	30.70
27-10	130.60	482.23	3150.00	-459.27	983.08	6.10	21.80	26.80
27-10	126.44	477.77	3150.00	-468.84	977.52	6.10	22.20	28.20
27-10	122.29	473.31	3150.00	-478.39	971.97	6.10	22.20	28.60
27-10	118.54	469.30	3150.00	-487.01	966.97	4.88	23.00	29.70
27-10	109.40	459.49	3150.00	-508.46	954.44	4.88	17.10	19.90
27-10	101.50	451.02	3150.00	-526.80	943.77	6.10	17.80	22.40
27-10	97.30	446.60	3150.00	-536.50	938.16	6.10	15.60	18.10
27-10	93.07	442.21	3150.00	-546.24	932.55	6.10	16.00	17.50
27-10	88.41	437.39	3150.00	-557.46	926.37	7.32	20.20	26.60
27-10	82.16	430.92	3150.00	-571.42	918.27	5.18	19.50	23.40
27-10	77.93	426.54	3150.00	-580.87	912.79	7.01	22.80	27.70
27-10	73.70	422.16	3150.00	-590.32	907.30	5.18	23.00	26.90
27-10	69.57	417.88	3150.00	-599.56	901.95	6.71	26.70	34.60
27-10	51.24	398.32	3150.00	-639.97	794.62	6.71	33.50	45.80
27-10	47.39	393.21	3150.00	-649.58	786.22	6.10	33.00	44.40
27-10	43.72	388.34	3150.00	-658.75	778.22	6.10	37.80	50.50
27-10	40.06	383.47	3150.00	-667.90	770.23	6.10	39.30	53.30
27-10	36.38	378.60	3150.00	-677.08	762.22	6.10	39.10	56.70
27-10	20.42	356.36	3150.00	-717.52	726.36	6.10	45.20	64.00

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
27-10	18.49	352.22	3150.00	-723.20	720.57	3.05	37.90	51.10
27-10	13.98	342.55	3150.00	-736.47	707.04	6.10	56.60	83.40
27-10	11.41	337.03	3150.00	-780.80	595.99	6.10	56.70	85.90
27-10	7.86	329.43	3150.00	-785.67	571.98	10.67	47.10	67.10
27-10	4.00	321.14	3150.00	-790.97	545.82	7.62	42.90	60.60
27-10	1.10	314.93	3150.00	-794.94	526.21	6.10	47.50	70.00
03-14	380.40	716.56	3150.00	580.74	924.63	7.92	37.20	46.50
03-14	373.01	708.05	3150.00	543.10	947.43	6.10	27.80	29.90
03-14	368.50	702.87	3150.00	522.26	959.52	7.62	30.50	35.00
03-14	359.50	692.52	3150.00	484.80	981.62	7.62	34.70	42.20
03-14	339.01	668.94	3150.00	.00	.00	6.10	18.60	17.50
03-14	329.51	658.01	3150.00	.00	.00	7.62	24.20	26.70
02-11	552.61	695.81	3150.00	792.31	599.28	6.10	37.70	47.90
02-11	548.30	691.50	3150.00	777.98	594.75	6.10	37.50	48.80
02-11	543.99	687.19	3150.00	763.64	590.23	6.10	37.80	48.10
02-11	538.92	682.12	3150.00	789.44	599.81	8.23	25.60	31.60
02-11	533.86	677.06	3150.00	768.88	593.09	6.10	27.40	33.80
02-11	529.55	672.75	3150.00	751.36	587.37	6.10	23.90	26.90
02-11	525.24	668.44	3150.00	640.82	575.61	6.10	35.40	46.60
02-11	520.93	664.13	3150.00	635.41	595.77	6.10	22.50	26.60
02-11	516.62	659.82	3150.00	629.95	597.29	6.10	22.10	26.80
02-11	512.31	655.51	3150.00	624.50	598.80	6.10	39.00	50.40
02-11	508.00	651.20	3150.00	618.89	599.90	6.10	39.30	51.30
02-11	503.69	646.89	3150.00	612.88	599.90	6.10	20.90	29.00
02-11	499.70	642.90	3150.00	605.55	632.17	5.18	3.90	8.90
02-11	491.99	635.30	3150.00	584.61	708.16	6.10	44.40	58.20
02-11	487.57	631.11	3150.00	565.14	734.27	6.10	34.40	46.90
02-11	483.15	626.91	3150.00	545.64	760.40	6.10	37.50	48.20
02-11	479.17	623.13	3150.00	528.09	783.92	4.88	41.60	52.10
28-01	714.76	674.44	3150.00	2258.12	599.90	6.10	29.30	33.90
28-01	711.63	669.03	3150.00	2195.55	595.23	6.40	27.30	32.90
28-01	707.29	661.51	3150.00	1641.25	669.99	3.05	23.40	25.80
28-01	705.08	657.68	3150.00	1381.57	700.16	5.79	32.00	42.60
28-01	699.80	648.59	3150.00	1131.30	591.25	6.10	30.70	39.10
28-01	696.70	643.34	3150.00	1117.90	585.35	6.10	37.00	48.50
28-01	693.61	638.08	3150.00	1129.12	591.94	6.10	28.60	34.90
28-01	690.52	632.83	3150.00	1109.27	582.58	6.10	26.70	31.50
28-01	687.42	627.58	3150.00	1089.42	573.23	6.10	18.60	23.60
28-01	684.33	622.32	3150.00	1069.54	563.86	6.10	20.50	25.30
28-01	681.23	617.07	3150.00	1049.69	554.50	6.10	29.70	37.50
28-01	678.14	611.82	3150.00	1029.85	545.15	6.10	36.80	47.80
28-01	675.05	606.57	3150.00	947.38	545.07	6.10	34.10	40.80
28-01	671.95	601.32	3150.00	941.75	544.36	6.10	33.60	41.10
28-01	669.29	596.87	3150.00	935.46	543.72	4.27	33.80	40.80
28-01	666.58	592.45	3150.00	929.19	542.41	6.10	31.40	37.40
28-01	663.40	587.26	3150.00	923.45	542.88	6.10	37.40	48.10

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
28-01	660.21	582.06	3150.00	917.70	542.36	6.10	36.20	45.50
28-01	657.03	576.86	3150.00	911.96	541.82	6.10	34.10	43.20
28-01	653.84	571.66	3150.00	787.63	535.72	6.10	34.40	40.30
28-01	650.66	566.47	3150.00	781.53	533.56	6.10	34.20	41.20
28-01	647.47	561.27	3150.00	765.96	527.63	6.10	32.90	42.00
28-01	644.29	556.07	3150.00	750.40	521.69	6.10	32.20	39.80
28-01	641.10	550.87	3150.00	734.83	515.76	6.10	34.70	42.60
28-01	637.84	545.72	3150.00	631.02	522.35	6.10	27.00	31.50
28-01	634.50	540.63	3150.00	655.16	512.29	6.10	30.20	36.80
28-01	631.99	536.80	3150.00	673.31	504.72	3.05	32.90	42.30
28-01	606.59	498.05	3150.00	459.84	399.90	6.10	17.50	21.50
28-01	603.13	493.22	3150.00	447.91	526.14	5.79	33.50	41.10
28-01	599.47	488.54	3150.00	432.73	562.57	6.10	21.40	24.30
28-01	595.72	483.74	3150.00	417.18	599.92	6.10	28.70	34.10
28-01	591.97	478.94	3150.00	389.46	715.22	6.10	32.10	37.70
28-01	588.22	474.13	3150.00	373.56	734.98	6.10	32.60	38.40
28-01	584.46	469.33	3150.00	359.37	752.27	6.10	39.30	49.60
28-01	580.71	464.52	3150.00	345.16	769.56	6.10	38.80	49.10
28-01	570.01	450.83	3150.00	313.24	819.22	6.10	22.20	25.50
28-01	567.48	447.59	3150.00	308.91	831.23	2.13	15.60	17.50
28-01	559.03	436.41	3150.00	294.88	871.29	3.96	33.80	43.30
28-01	551.96	427.03	3150.00	276.64	904.12	6.10	36.00	43.10
28-01	548.29	422.16	3150.00	253.83	917.46	6.10	38.80	48.60
28-01	544.63	417.30	3150.00	231.06	930.78	6.10	35.60	43.10
28-01	540.96	412.43	3150.00	208.25	944.12	6.10	29.60	35.10
28-01	538.58	409.27	3150.00	193.45	952.78	1.83	34.90	42.90
28-01	537.20	407.44	3150.00	184.87	957.80	2.74	7.60	5.90
28-01	534.54	403.91	3150.00	168.33	967.47	6.10	26.20	31.10
28-01	530.87	399.04	3150.00	145.52	980.82	6.10	32.80	37.70
28-01	527.95	395.33	3150.00	146.75	979.71	3.35	24.60	17.30
28-01	525.87	392.90	3150.00	136.97	985.51	3.05	14.40	21.40
28-01	523.89	390.58	3150.00	112.58	1000.26	3.05	11.50	11.20
28-01	520.82	386.98	3150.00	105.40	1019.09	6.40	16.50	16.00
28-01	517.75	383.39	3150.00	98.07	1038.42	3.05	11.50	11.10
28-01	451.73	302.35	3150.00	-61.71	1010.38	6.10	10.30	9.30
28-01	447.49	297.96	3150.00	-71.04	996.70	6.10	19.40	20.40
28-01	443.26	293.58	3150.00	-81.18	990.75	6.10	22.80	26.30
28-01	439.03	289.19	3150.00	-91.33	984.78	6.10	25.50	27.50
28-01	434.79	284.81	3150.00	-101.48	978.82	6.10	27.80	30.60
28-01	430.48	280.50	3150.00	-110.45	973.44	6.10	24.30	25.90
28-01	426.09	276.26	3150.00	-120.09	968.06	6.10	27.30	25.80
28-01	421.71	272.03	3150.00	-129.52	962.86	6.10	18.80	17.90
28-01	417.33	267.79	3150.00	-140.03	956.80	6.10	20.20	20.50
28-01	412.94	263.56	3150.00	-150.54	950.75	6.10	20.20	20.60
28-01	408.55	259.32	3150.00	-161.06	944.70	6.10	18.90	19.70
28-01	404.17	255.09	3150.00	-171.55	938.65	6.10	23.40	24.30

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
28-01	399.78	250.86	3150.00	-182.06	932.61	6.10	26.60	31.80
28-01	395.40	246.62	3150.00	-192.57	926.55	6.10	22.00	26.30
28-01	391.02	242.39	3150.00	-203.06	920.51	6.10	16.40	20.30
28-01	386.63	238.15	3150.00	-213.58	914.45	6.10	31.10	37.50
28-01	382.24	233.92	3150.00	-224.90	908.05	6.10	26.60	32.70
28-01	378.84	230.63	3150.00	-233.13	903.34	3.35	12.10	12.40
28-01	376.54	228.41	3150.00	-238.69	900.16	3.05	13.70	15.50
28-01	367.34	219.52	3150.00	-256.44	854.08	3.05	2.40	2.50
28-01	364.05	216.34	3150.00	-260.31	837.12	6.10	38.20	52.40
28-01	359.66	212.11	3150.00	-279.55	793.30	6.10	35.50	46.90
28-01	355.28	207.87	3150.00	-292.89	781.13	6.10	37.90	49.40
28-01	350.89	203.64	3150.00	-306.23	768.97	6.10	37.50	47.00
28-01	346.51	199.41	3150.00	-319.56	756.81	6.10	44.30	60.10
28-01	342.12	195.17	3150.00	-332.91	744.64	6.10	47.50	65.30
28-01	338.94	192.10	3150.00	-342.58	735.82	2.74	36.70	46.80
28-01	336.42	189.67	3150.00	-350.25	728.83	4.27	16.20	14.90
28-01	334.12	187.44	3150.00	-357.25	722.43	2.13	38.50	50.40
28-01	331.49	184.90	3150.00	-365.25	715.14	5.18	26.70	32.60
28-01	328.53	182.04	3150.00	-374.26	706.92	3.05	5.80	4.50
28-01	318.49	172.25	3150.00	-398.71	668.85	3.05	10.20	7.70
28-01	315.97	169.60	3150.00	-402.77	661.26	4.27	31.80	39.30
28-01	313.45	166.95	3150.00	-406.82	653.67	3.05	2.10	.50
28-01	295.09	147.40	3150.00	-438.47	587.94	6.10	35.00	45.00
28-01	291.39	143.15	3150.00	-450.42	539.40	5.18	33.40	41.90
27-06	852.28	638.36	3150.00	2049.91	510.19	5.79	32.20	43.10
27-06	847.70	629.58	3150.00	2061.66	529.26	5.49	27.30	34.70
27-06	845.14	624.38	3150.00	2069.40	540.71	6.10	22.50	27.90
27-06	843.05	620.15	3150.00	2075.36	550.21	3.35	16.70	19.50
27-06	839.61	613.18	3150.00	2085.19	565.86	5.49	24.00	30.50
27-06	837.05	607.98	3150.00	2092.51	577.53	6.10	24.70	30.40
27-06	834.33	602.87	3150.00	2099.99	589.16	5.49	37.40	48.10
27-06	815.09	570.00	3150.00	1092.40	702.04	4.27	34.40	44.60
27-06	803.18	553.60	3150.00	1240.97	574.43	5.79	33.10	41.90
27-06	799.69	548.79	3150.00	1170.64	539.24	6.10	26.30	33.10
24-05	944.79	569.22	3150.00	1928.61	502.04	6.40	33.20	43.60
24-05	941.46	565.65	3150.00	1935.68	511.51	1.52	20.70	25.70
24-05	935.85	559.64	3150.00	1947.59	527.45	8.23	22.20	27.70
24-05	930.96	554.39	3150.00	1957.98	541.37	6.10	21.10	24.70
24-05	924.31	547.26	3150.00	1972.11	560.27	4.88	24.00	31.20
24-05	920.57	543.25	3150.00	1980.05	570.91	6.10	27.30	33.50
24-05	916.41	538.79	3150.00	1988.89	582.74	6.10	32.30	42.20
24-05	913.40	535.56	3150.00	1995.29	591.30	2.74	36.90	50.50
24-05	879.62	499.34	3150.00	1364.51	588.70	6.10	30.00	42.10
24-05	875.46	494.88	3150.00	1286.43	550.44	6.10	32.50	43.30
24-05	872.45	491.64	3150.00	1229.82	522.68	2.74	35.00	49.70
24-05	712.88	362.83	3150.00	281.77	520.69	6.40	31.70	44.00

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
24-05	707.46	359.70	3150.00	274.50	544.77	6.10	31.60	41.50
24-05	702.19	356.65	3150.00	267.42	568.20	6.10	40.50	55.10
24-05	697.04	353.68	3150.00	260.52	591.07	5.79	37.20	50.20
24-05	686.88	347.82	3150.00	236.15	709.39	6.10	38.70	50.50
24-05	681.60	344.77	3150.00	226.27	723.56	6.10	29.50	38.10
24-05	676.41	341.58	3150.00	216.31	737.60	6.10	36.90	48.00
24-05	671.30	338.24	3150.00	206.24	751.54	6.10	34.10	44.40
24-05	666.96	335.40	3150.00	197.68	763.39	4.27	36.60	46.80
041-1	-558.00	788.29	3300.00	-1335.01	535.91	6.10	35.90	45.20
041-1	-561.66	783.42	3300.00	-1344.75	529.89	6.10	35.60	44.90
041-1	-565.33	778.55	3300.00	-1354.51	523.85	6.10	37.40	48.50
041-1	-569.00	773.68	3300.00	-1364.28	517.82	6.10	32.80	43.20
041-1	-572.67	768.81	3300.00	-1374.05	511.79	6.10	29.50	38.90
041-1	-575.42	765.16	3300.00	-1381.37	507.27	3.05	37.10	49.40
041-1	-577.25	762.73	3300.00	-1386.24	504.26	3.05	26.80	34.90
041-1	-583.58	754.33	3300.00	-1409.01	380.92	2.13	26.10	34.00
035-4	-479.66	758.82	3300.00	-1146.05	591.91	6.10	57.80	85.00
035-4	-483.16	753.82	3300.00	-1159.10	584.49	6.10	33.30	43.60
035-4	-486.65	748.83	3300.00	-1172.12	577.10	6.10	29.20	36.30
035-4	-490.15	743.83	3300.00	-1184.38	569.04	6.10	27.10	33.20
035-4	-492.51	740.46	3300.00	-1192.19	564.60	2.13	32.40	42.10
035-4	-497.14	733.85	3300.00	-1206.51	556.00	3.05	31.60	38.90
035-4	-504.40	723.49	3300.00	-1233.37	540.85	5.18	41.00	54.20
035-4	-507.89	719.06	3300.00	-1245.84	534.00	6.10	39.30	62.20
035-4	-511.88	714.46	3300.00	-1259.73	526.53	6.10	36.00	46.10
035-4	-515.88	709.86	3300.00	-1273.65	519.05	6.10	37.80	50.40
035-4	-519.88	705.26	3300.00	-1287.57	511.57	6.10	36.50	47.20
035-4	-523.88	700.66	3300.00	-1301.49	504.10	6.10	36.90	49.20
035-4	-527.88	696.06	3300.00	-1320.68	392.26	6.10	25.10	34.30
035-4	-531.88	691.46	3300.00	-1327.44	377.49	6.10	32.20	45.10
08-04	-393.26	771.90	3300.00	-844.29	964.55	6.10	25.00	30.50
08-04	-394.32	765.90	3300.00	-849.15	957.28	6.10	25.60	30.20
08-04	-395.37	759.90	3300.00	-853.99	950.02	6.10	20.20	23.10
08-04	-396.43	753.90	3300.00	-858.86	942.76	6.10	22.70	26.90
08-04	-397.49	747.89	3300.00	-866.41	933.85	6.10	20.30	24.30
08-04	-398.55	741.89	3300.00	-873.31	924.97	6.10	22.10	27.60
08-04	-399.34	737.39	3300.00	-878.48	918.31	3.05	26.00	30.80
08-04	-399.87	734.38	3300.00	-881.94	913.86	3.05	29.70	38.10
08-04	-400.54	730.63	3300.00	-884.63	910.09	4.57	25.80	33.70
08-04	-401.46	725.38	3300.00	-890.86	901.54	6.10	20.40	25.90
08-04	-402.52	719.37	3300.00	-915.98	785.41	6.10	19.70	27.70
08-04	-403.58	713.37	3300.00	-931.61	768.70	6.10	18.60	27.20
08-04	-405.70	701.37	3300.00	-956.25	740.45	6.10	21.40	26.10
08-04	-406.75	695.36	3300.00	-967.01	728.08	6.10	20.40	26.10
08-04	-407.81	689.36	3300.00	-988.36	706.72	6.10	17.40	20.90
08-04	-408.87	683.35	3300.00	-1034.26	595.95	6.10	21.70	30.10

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
08-04	-409.93	677.35	3300.00	-1040.64	590.77	6.10	32.90	43.70
08-04	-410.99	671.35	3300.00	-1047.03	585.58	6.10	23.60	29.00
08-04	-412.05	665.34	3300.00	-1053.42	580.38	6.10	32.80	39.10
08-04	-416.49	640.13	3300.00	-1081.97	557.37	2.44	36.90	49.00
08-04	-418.77	627.23	3300.00	-1094.14	546.23	5.49	45.90	65.90
08-04	-420.99	614.62	3300.00	-1108.04	534.86	6.10	34.10	47.40
08-04	-422.05	608.61	3300.00	-1113.67	530.97	6.10	38.70	52.40
08-04	-428.11	574.24	3300.00	-1145.08	503.89	2.74	29.40	39.80
077-2	-212.89	609.81	3300.00	-581.69	990.65	6.71	18.80	21.30
077-2	-215.39	603.92	3300.00	-599.12	969.44	6.10	31.10	41.50
077-2	-217.77	598.30	3300.00	-615.74	949.23	6.10	24.90	31.20
077-2	-220.16	592.69	3300.00	-632.37	929.01	6.10	20.00	23.40
077-2	-222.59	587.10	3300.00	-649.11	908.72	6.10	31.20	39.40
077-2	-225.07	581.53	3300.00	-690.89	778.76	6.10	25.10	31.10
077-2	-227.54	575.97	3300.00	-716.13	757.16	6.10	16.50	18.80
077-2	-230.03	570.39	3300.00	-741.47	735.47	6.10	21.10	23.70
077-2	-232.50	564.82	3300.00	-766.74	713.84	6.10	18.50	22.50
077-2	-234.98	559.26	3300.00	-821.34	596.64	6.10	18.20	21.80
077-2	-237.46	553.69	3300.00	-829.24	591.08	6.10	12.20	11.90
077-2	-239.94	548.12	3300.00	-837.14	585.52	6.10	30.90	39.40
077-2	-242.43	542.39	3300.00	-845.16	579.99	6.40	23.90	29.60
077-2	-247.20	531.16	3300.00	-861.25	568.63	5.79	34.70	46.10
077-2	-249.52	525.70	3300.00	-869.07	563.10	6.10	15.60	19.20
077-2	-251.37	521.35	3300.00	-875.31	558.70	3.35	20.00	26.40
077-2	-254.52	513.91	3300.00	-885.96	551.18	4.88	33.70	44.80
077-2	-256.67	508.86	3300.00	-893.20	546.07	6.10	37.00	49.90
077-2	-259.64	501.85	3300.00	-903.23	538.98	9.14	35.70	46.30
077-2	-267.14	483.50	3300.00	-929.09	520.06	30.48	53.20	78.80
077-2	-274.05	466.41	3300.00	-953.36	503.11	6.40	36.30	47.60
28-02	565.15	663.27	3300.00	754.95	588.81	6.10	27.40	34.60
28-02	563.54	658.83	3300.00	761.90	564.23	3.35	36.00	47.30
28-02	561.09	652.10	3300.00	772.44	526.94	4.27	28.70	37.20
28-02	475.94	520.29	3300.00	437.88	397.26	1.83	43.10	56.80
28-02	465.59	507.50	3300.00	421.33	471.62	6.10	35.70	44.60
28-02	461.75	502.76	3300.00	395.94	513.34	6.10	43.00	56.00
28-02	457.91	498.03	3300.00	383.03	521.77	6.10	37.70	46.10
28-02	454.18	493.41	3300.00	367.72	532.30	5.79	33.80	42.00
28-02	447.18	484.76	3300.00	339.04	552.04	6.10	36.20	40.60
28-02	443.72	480.50	3300.00	324.90	561.79	4.88	27.50	31.30
28-02	436.43	471.50	3300.00	295.06	582.34	6.10	25.60	27.20
28-02	432.69	466.88	3300.00	279.74	592.89	5.79	20.10	19.90
28-02	405.59	433.33	3300.00	223.08	690.50	3.05	14.10	14.50
28-02	402.84	429.68	3300.00	215.10	702.64	6.10	17.10	19.00
28-02	399.17	424.81	3300.00	193.18	722.34	6.10	15.00	15.80
28-02	389.45	411.91	3300.00	135.14	774.51	6.10	20.70	21.50
28-02	386.61	408.13	3300.00	122.34	786.47	3.35	19.10	19.40

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
28-02	377.44	396.15	3300.00	91.33	883.29	6.10	16.80	16.10
28-02	373.61	391.41	3300.00	80.86	906.25	6.10	17.50	19.60
28-02	370.92	388.10	3300.00	73.29	912.51	2.44	21.20	23.60
28-02	364.78	380.52	3300.00	54.47	929.35	6.10	21.30	23.60
28-02	360.95	375.78	3300.00	45.47	935.76	6.10	25.00	28.70
28-02	357.11	371.04	3300.00	36.46	942.20	6.10	21.80	24.40
28-02	353.27	366.30	3300.00	25.28	949.71	6.10	19.20	19.90
28-02	349.73	361.92	3300.00	4.18	949.86	5.18	20.10	22.40
28-02	344.83	355.88	3300.00	-7.46	941.48	6.10	20.10	21.80
28-02	341.00	351.14	3300.00	-16.05	933.75	6.10	19.80	22.40
28-02	336.96	346.58	3300.00	-25.57	924.36	6.10	20.50	22.80
28-02	332.73	342.20	3300.00	-33.24	919.28	6.10	18.30	20.00
28-02	328.49	337.81	3300.00	-40.93	914.20	6.10	19.00	20.10
28-02	324.79	333.97	3300.00	-58.48	835.15	4.57	20.90	24.50
28-02	321.08	330.14	3300.00	-60.78	838.42	6.10	14.60	15.50
28-02	316.85	325.75	3300.00	-80.86	785.97	6.10	18.10	20.00
28-02	312.61	321.37	3300.00	-90.02	780.88	6.10	18.40	20.80
28-02	308.38	316.98	3300.00	-103.99	770.29	6.10	20.40	22.90
28-02	304.14	312.60	3300.00	-117.96	759.72	6.10	17.00	17.60
28-02	299.91	308.21	3300.00	-131.93	749.13	6.10	14.80	15.00
28-02	295.60	303.90	3300.00	-145.90	738.64	6.10	22.20	26.40
28-02	291.21	299.67	3300.00	-159.88	728.24	6.10	29.90	35.30
28-02	286.83	295.43	3300.00	-171.19	720.93	6.10	19.70	20.90
28-02	282.44	291.20	3300.00	-189.31	707.45	6.10	24.00	27.50
28-02	279.15	288.02	3300.00	-211.60	662.80	3.05	31.70	36.30
28-02	275.76	284.74	3300.00	-221.25	644.18	.91	30.80	38.30
28-02	269.51	278.71	3300.00	-251.22	592.49	6.10	30.90	36.50
28-02	265.12	274.47	3300.00	-263.82	585.49	6.10	30.90	37.10
28-02	261.72	271.19	3300.00	-270.41	580.91	3.35	30.00	36.40
28-02	251.79	261.97	3300.00	-297.10	566.80	6.10	27.10	33.80
28-02	247.05	258.13	3300.00	-310.21	559.93	6.10	38.70	48.70
28-02	243.38	255.16	3300.00	-320.36	554.62	3.35	42.40	54.50
28-02	239.59	252.09	3300.00	-330.84	549.13	6.40	40.20	53.60
28-02	234.73	248.15	3300.00	-344.29	542.08	6.10	39.60	49.80
28-02	230.00	244.32	3300.00	-357.68	535.52	6.10	40.00	51.00
28-02	225.26	240.48	3300.00	-369.70	529.28	6.10	43.60	56.30
28-02	220.52	236.65	3300.00	-381.70	523.06	6.10	48.00	63.30
28-02	215.67	232.71	3300.00	-396.17	515.97	6.40	40.90	54.20
28-02	209.27	227.54	3300.00	-413.64	506.80	5.18	18.30	20.90
28-02	205.75	224.40	3300.00	-423.60	501.44	4.27	16.40	17.50
24-02	-26.18	531.14	3450.00	-328.67	797.38	6.10	19.00	21.60
24-02	-28.99	525.73	3450.00	-342.11	791.66	6.10	17.90	19.80
24-02	-31.81	520.32	3450.00	-355.57	785.93	6.10	27.30	33.50
24-02	-34.62	514.91	3450.00	-368.60	780.37	6.10	26.90	32.80
24-02	-37.44	509.51	3450.00	-382.73	774.40	6.10	24.90	29.20
24-02	-40.25	504.10	3450.00	-396.85	768.42	6.10	22.00	25.00

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
24-02	-43.07	498.69	3450.00	-411.00	762.44	6.10	22.20	26.60
24-02	-45.88	493.28	3450.00	-425.12	756.46	6.10	25.60	31.20
24-02	-48.70	487.88	3450.00	-439.26	750.49	6.10	27.20	35.80
24-02	-51.51	482.47	3450.00	-453.38	744.51	6.10	27.90	35.40
24-02	-54.32	477.07	3450.00	-467.49	738.55	6.10	25.30	31.90
24-02	-57.14	471.66	3450.00	-481.63	732.56	6.10	26.20	33.20
24-02	-59.95	466.25	3450.00	-491.62	727.49	6.10	26.40	34.20
24-02	-62.77	460.84	3450.00	-505.62	721.50	6.10	28.50	35.70
24-02	-65.58	455.44	3450.00	-519.59	715.53	6.10	26.50	32.70
24-02	-68.40	450.03	3450.00	-533.60	709.54	6.10	30.60	39.30
24-02	-71.00	445.03	3450.00	-546.53	704.01	5.18	17.90	19.20
24-02	-79.39	430.87	3450.00	-577.01	608.69	1.52	30.80	41.00
24-02	-84.38	422.66	3450.00	-592.41	587.98	4.27	36.10	47.60
24-02	-85.88	420.19	3450.00	-597.03	583.83	1.52	33.80	40.80
24-02	-87.62	417.32	3450.00	-602.40	579.02	5.18	31.40	38.40
24-02	-89.51	414.20	3450.00	-608.23	573.78	2.13	23.50	11.20
24-02	-91.65	410.68	3450.00	-614.83	567.87	6.10	24.30	49.50
24-02	-94.81	405.46	3450.00	-624.58	559.11	6.10	55.90	75.20
24-02	-97.97	400.25	3450.00	-634.32	550.37	6.10	39.70	54.00
24-02	-101.14	395.04	3450.00	-644.65	541.62	6.10	42.60	56.90
24-02	-104.92	388.43	3450.00	-656.72	530.71	9.14	39.10	51.90
24-02	-108.58	381.75	3450.00	-668.77	519.76	6.10	40.20	55.00
24-02	-111.51	376.40	3450.00	-677.98	511.28	6.10	38.70	50.60
24-02	-114.08	371.73	3450.00	-686.04	503.87	4.57	40.00	52.70
09-06	-184.23	718.82	3450.00	-601.01	793.20	5.49	21.80	25.30
09-06	-184.74	713.06	3450.00	-604.76	790.18	6.10	17.90	19.40
09-06	-185.27	706.98	3450.00	-601.66	789.11	6.10	18.90	20.00
09-06	-185.80	700.91	3450.00	-605.78	785.89	6.10	27.60	31.80
09-06	-186.33	694.84	3450.00	-604.04	784.97	6.10	20.00	22.30
09-06	-186.86	688.76	3450.00	-608.29	781.71	6.10	22.30	25.90
09-06	-187.40	682.69	3450.00	-611.09	779.21	6.10	18.20	17.60
09-06	-187.93	676.62	3450.00	-609.99	778.30	6.10	20.50	22.40
09-06	-188.19	670.53	3450.00	-608.04	777.07	6.10	29.20	31.80
09-06	-188.19	664.44	3450.00	-605.56	776.05	6.10	23.50	26.30
09-06	-188.19	658.34	3450.00	-609.95	772.57	6.10	17.10	16.10
09-06	-188.19	652.25	3450.00	-608.22	771.25	6.10	18.40	19.00
09-06	-188.19	646.15	3450.00	-606.60	769.53	6.10	17.70	18.70
09-06	-188.19	640.05	3450.00	-611.24	766.01	6.10	22.50	28.00
09-06	-188.19	633.96	3450.00	-609.06	764.25	6.10	25.20	30.00
09-06	-188.19	615.67	3450.00	-618.47	755.10	6.10	20.70	27.80
29-03	-264.95	704.10	3450.00	-726.97	763.93	7.01	11.20	14.10
29-03	-268.23	698.42	3450.00	-733.67	760.71	6.10	26.60	32.90
29-03	-271.27	693.15	3450.00	-739.89	757.73	6.10	25.80	33.30
29-03	-280.87	677.58	3450.00	-759.10	748.26	6.10	22.20	27.40
29-03	-284.10	672.41	3450.00	-765.54	745.77	6.10	24.60	32.40
29-03	-287.33	667.24	3450.00	-771.98	742.78	6.10	22.60	28.40

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
29-03	-290.56	662.07	3450.00	-768.85	741.08	6.10	18.10	21.40
29-03	-293.79	656.90	3450.00	-774.50	738.31	6.10	24.30	29.70
29-03	-297.02	651.74	3450.00	-780.14	735.54	6.10	22.60	27.90
29-03	-300.26	646.56	3450.00	-785.81	732.76	6.10	27.70	37.70
29-03	-303.49	641.39	3450.00	-791.45	729.98	6.10	28.40	37.40
29-03	-306.62	636.17	3450.00	-798.08	726.80	6.10	22.90	28.90
29-03	-309.67	630.89	3450.00	-803.50	724.03	6.10	27.70	35.00
29-03	-312.72	625.61	3450.00	-808.92	721.26	6.10	27.90	35.30
29-03	-315.77	620.33	3450.00	-814.33	718.48	6.10	28.60	36.20
29-03	-318.82	615.05	3450.00	-819.75	715.71	6.10	26.10	33.10
29-03	-321.86	609.77	3450.00	-825.15	712.94	6.10	21.90	26.70
29-03	-324.91	604.49	3450.00	-824.75	715.51	6.10	31.80	42.20
29-03	-327.96	599.22	3450.00	-837.19	710.50	6.10	33.60	42.00
29-03	-331.01	593.93	3450.00	-842.38	708.02	6.10	24.60	29.20
29-03	-334.29	588.26	3450.00	-845.97	705.90	7.01	24.30	28.10
29-03	-336.57	584.30	3450.00	-848.45	704.42	2.13	14.20	12.00
29-03	-362.54	541.05	3450.00	-918.42	571.77	2.44	30.30	37.80
27-05	805.26	551.46	3450.00	1458.04	747.54	6.10	35.30	46.90
27-05	801.59	546.60	3450.00	1427.52	770.27	6.10	34.70	46.60
27-05	798.93	543.07	3450.00	.00	.00	2.74	27.70	35.40
27-05	792.51	534.54	3450.00	1170.32	784.97	6.40	28.30	35.70
27-05	789.39	530.41	3450.00	1158.68	770.93	3.96	15.50	16.70
27-05	784.44	523.84	3450.00	1139.72	747.48	7.01	26.80	34.30
27-05	780.50	518.60	3450.00	1123.63	727.98	6.10	22.20	26.40
27-05	776.66	513.87	3450.00	1108.44	709.84	6.10	29.50	37.80
27-05	773.96	510.76	3450.00	1099.37	693.44	2.13	35.30	47.20
27-05	492.86	229.56	3450.00	40.09	506.62	.61	3.90	1.30
27-05	491.68	228.37	3450.00	38.37	507.20	2.74	11.00	11.40
27-05	485.97	222.66	3450.00	29.68	511.62	3.05	11.80	9.50
27-05	482.84	219.54	3450.00	27.37	512.83	5.79	40.50	49.10
27-05	480.26	216.95	3450.00	23.65	513.75	1.52	24.90	22.60
27-05	478.42	215.12	3450.00	21.02	514.42	3.66	31.40	37.70
01-13	720.78	647.02	3450.00	1663.90	671.61	6.10	34.90	43.90
01-13	718.70	641.29	3450.00	1651.49	686.29	6.10	34.00	44.60
01-13	716.61	635.56	3450.00	1605.22	726.94	6.10	26.80	36.60
01-13	712.44	624.10	3450.00	1546.08	772.15	6.10	32.70	31.40
01-13	710.11	618.48	3450.00	1514.26	795.87	6.10	15.50	10.50
01-13	707.54	612.95	3450.00	.00	.00	6.10	27.70	24.30
01-13	704.96	607.43	3450.00	1057.08	785.47	6.10	23.90	28.90
01-13	702.38	601.91	3450.00	1039.14	763.93	6.10	30.10	36.40
01-13	698.13	592.79	3450.00	1009.54	728.36	5.49	21.00	21.50
01-13	687.96	570.97	3450.00	986.11	634.16	6.10	26.70	32.50
01-13	685.38	565.44	3450.00	986.17	609.00	6.10	32.30	39.00
01-13	682.80	559.92	3450.00	981.56	591.92	6.10	23.70	28.50
01-13	677.91	549.42	3450.00	968.28	568.70	6.10	18.50	22.50
01-13	674.43	541.96	3450.00	958.83	552.19	6.10	27.80	34.40

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
01-13	671.85	536.43	3450.00	951.83	539.96	6.10	36.30	45.40
01-13	669.54	531.46	3450.00	945.55	528.97	4.88	36.70	45.40
01-13	662.71	516.82	3450.00	928.86	496.01	4.88	35.00	45.60
04-11	488.06	628.37	3450.00	722.19	497.05	9.45	29.60	35.80
04-11	429.64	531.75	3450.00	374.25	507.05	9.14	37.20	48.20
04-10	323.09	672.63	3450.00	520.12	525.58	6.10	37.70	44.00
04-10	320.04	667.35	3450.00	513.95	526.90	6.10	38.60	47.60
04-10	316.99	662.08	3450.00	501.66	540.88	6.10	40.50	51.50
04-10	313.94	656.80	3450.00	496.61	546.23	6.10	42.80	57.50
04-10	310.89	651.51	3450.00	488.52	551.05	6.10	37.40	46.20
04-10	307.85	646.24	3450.00	479.48	556.18	6.10	35.50	41.10
04-10	304.58	641.10	3450.00	470.65	562.06	6.10	40.30	47.80
04-10	301.08	636.11	3450.00	461.89	568.14	6.10	37.80	45.30
04-10	297.58	631.11	3450.00	453.10	574.22	6.10	34.30	38.20
04-10	294.08	626.12	3450.00	444.35	580.45	6.10	36.80	42.70
04-10	290.59	621.12	3450.00	434.66	587.90	6.10	40.80	48.90
04-10	287.09	616.13	3450.00	425.90	593.77	6.10	42.00	53.00
04-10	284.47	612.38	3450.00	419.33	598.17	3.05	36.80	44.20
04-10	278.61	604.02	3450.00	398.89	702.52	7.01	24.20	26.30
04-10	274.86	598.66	3450.00	386.63	707.42	6.10	19.60	24.30
04-10	271.36	593.66	3450.00	374.56	712.27	6.10	24.60	29.40
08-05	-367.89	732.53	3600.00	-655.92	792.49	6.10	21.30	26.20
08-05	-368.42	726.46	3600.00	-663.63	785.13	6.10	29.40	36.10
08-05	-369.08	718.86	3600.00	-673.27	775.93	9.14	33.60	44.60
08-05	-376.05	639.16	3600.00	-804.66	578.68	7.62	29.70	34.40
08-05	-377.38	623.98	3600.00	-816.60	564.17	7.62	28.30	34.30
08-05	-378.05	616.39	3600.00	-824.56	555.16	7.62	34.00	42.00
08-05	-379.84	595.89	3600.00	-845.97	531.03	6.10	40.30	49.60
08-05	-380.37	589.82	3600.00	-856.68	521.15	6.10	39.60	51.80
08-05	-380.90	583.75	3600.00	-862.13	514.41	6.10	46.60	65.60
08-05	-381.43	577.67	3600.00	-867.58	507.67	6.10	36.80	47.70
08-05	-381.96	571.60	3600.00	-873.03	500.94	6.10	20.10	23.20
08-06	-183.81	755.17	3600.00	-431.33	982.11	6.10	21.50	24.50
08-06	-184.34	749.10	3600.00	-433.86	975.45	6.10	23.30	21.40
08-06	-186.33	726.33	3600.00	-446.36	947.96	6.10	21.70	23.40
08-06	-186.73	721.77	3600.00	-444.39	945.03	3.05	27.60	31.70
08-06	-187.13	717.22	3600.00	-445.50	940.70	6.10	33.80	42.30
08-06	-188.40	705.10	3600.00	-445.69	931.62	6.10	22.50	22.20
08-06	-189.36	699.08	3600.00	-448.75	924.59	6.10	23.80	24.80
08-06	-190.31	693.06	3600.00	-445.51	924.34	6.10	25.70	30.20
08-06	-191.27	687.03	3600.00	-447.24	918.83	6.10	25.40	32.10
08-06	-192.22	681.01	3600.00	-446.18	915.23	6.10	27.20	31.30
08-06	-193.17	674.99	3600.00	-448.45	909.18	6.10	28.60	34.70
08-06	-194.13	668.97	3600.00	-446.91	905.59	6.10	26.60	30.80
08-06	-196.03	656.93	3600.00	-449.84	875.00	6.10	21.10	25.90
08-06	-196.99	650.91	3600.00	-447.69	863.13	6.10	22.10	24.30

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
08-06	-198.07	644.91	3600.00	-450.15	829.29	6.10	24.30	28.20
08-06	-199.29	638.94	3600.00	-456.36	797.10	6.10	21.30	23.80
08-06	-200.50	632.97	3600.00	-461.44	792.19	6.10	32.30	40.20
08-06	-201.72	626.99	3600.00	-466.53	787.27	6.10	27.40	35.50
08-06	-202.93	621.02	3600.00	-472.16	782.07	6.10	27.30	33.10
08-06	-204.15	615.04	3600.00	-478.03	776.67	6.10	23.20	30.70
08-06	-205.36	609.07	3600.00	-483.87	771.29	6.10	28.30	35.00
08-06	-206.58	603.10	3600.00	-489.74	765.90	6.10	24.30	32.90
08-06	-207.79	597.12	3600.00	-495.59	760.50	6.10	30.00	40.20
08-06	-209.01	591.15	3600.00	-501.45	755.11	6.10	27.20	36.70
08-06	-210.30	585.19	3600.00	-507.41	749.70	6.10	35.00	47.60
08-06	-211.67	579.25	3600.00	-513.49	744.26	6.10	21.00	28.10
08-06	-213.05	573.32	3600.00	-519.87	739.47	6.10	20.70	24.00
08-06	-214.42	567.37	3600.00	-526.09	734.00	6.10	18.30	23.80
08-06	-215.79	561.43	3600.00	-532.31	728.53	6.10	15.70	20.50
08-06	-218.87	548.07	3600.00	-546.29	716.25	6.10	23.60	29.80
08-06	-220.24	542.13	3600.00	-552.50	710.78	6.10	25.10	32.90
08-06	-221.62	536.19	3600.00	-558.73	705.32	6.10	17.50	20.20
08-06	-222.99	530.25	3600.00	-564.57	700.15	6.10	27.80	36.40
08-06	-224.56	524.36	3600.00	-591.48	599.90	6.10	28.50	35.20
08-06	-226.35	518.54	3600.00	-598.72	592.38	6.10	16.20	18.00
08-06	-227.91	513.43	3600.00	-605.58	585.36	4.57	11.60	13.00
08-07	-3.32	711.57	3600.00	357.92	906.77	9.14	.00	17.50
08-07	-3.98	703.97	3600.00	348.41	914.94	6.10	16.60	17.10
08-07	-4.52	697.90	3600.00	340.53	923.51	6.10	16.90	24.70
08-07	-5.05	691.83	3600.00	330.61	935.85	6.10	15.00	17.10
08-07	-5.63	685.76	3600.00	320.69	948.26	6.10	19.50	20.70
08-07	-6.91	673.64	3600.00	305.02	964.31	6.10	20.30	21.20
08-07	-7.54	667.57	3600.00	296.55	971.83	6.10	24.60	28.50
27-03	232.33	685.62	3600.00	440.55	561.04	6.10	33.90	40.60
27-03	230.24	680.88	3600.00	433.51	564.55	4.27	36.70	37.40
27-03	225.43	670.01	3600.00	417.36	572.61	3.05	30.30	30.30
27-03	222.85	664.15	3600.00	405.64	579.16	3.05	15.90	13.90
27-03	221.00	659.97	3600.00	398.29	583.41	6.10	28.40	35.00
27-03	218.53	654.39	3600.00	387.16	590.47	6.10	33.20	41.60
27-03	216.05	648.83	3600.00	378.30	595.16	6.10	36.30	47.00
27-03	213.57	643.26	3600.00	332.24	701.01	6.10	22.50	27.00
27-03	211.09	637.69	3600.00	322.09	706.55	6.10	31.10	38.80
27-03	208.61	632.12	3600.00	311.94	712.09	6.10	18.10	21.10
27-03	206.13	626.55	3600.00	307.18	712.43	6.10	24.00	28.10
27-03	203.65	620.98	3600.00	297.32	717.85	6.10	33.70	41.20
27-03	200.18	613.19	3600.00	283.52	725.43	3.05	23.10	25.10
27-03	198.32	609.01	3600.00	276.13	729.50	6.10	35.10	43.60
27-03	195.84	603.44	3600.00	266.26	734.92	6.10	32.20	40.10
27-03	193.19	597.95	3600.00	253.13	739.40	6.10	32.90	40.40
27-03	190.38	592.54	3600.00	244.22	744.62	6.10	21.00	25.70

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
27-03	188.12	588.22	3600.00	237.10	748.80	3.66	18.00	20.70
27-03	185.87	583.89	3600.00	224.61	753.33	1.22	17.30	20.70
27-03	183.20	578.76	3600.00	214.39	759.30	6.10	29.60	36.80
27-03	180.16	573.47	3600.00	203.75	765.67	6.10	28.00	36.00
27-03	177.81	569.74	3600.00	194.02	771.21	2.74	31.30	39.50
27-03	170.08	557.49	3600.00	167.47	788.06	6.10	29.00	33.20
27-03	167.97	554.14	3600.00	161.31	791.88	1.83	30.70	35.30
27-03	165.20	549.76	3600.00	153.25	796.90	6.10	31.00	37.00
27-03	162.96	546.31	3600.00	147.94	799.90	2.13	27.20	24.80
27-03	162.00	544.94	3600.00	146.75	808.98	1.22	43.20	51.80
27-03	159.90	541.94	3600.00	141.90	850.72	6.10	19.40	19.20
27-03	156.39	536.96	3600.00	125.19	915.95	6.10	13.00	10.70
27-03	152.89	531.97	3600.00	107.88	938.10	6.10	15.10	14.30
27-03	149.38	526.98	3600.00	85.06	968.81	6.10	17.10	17.80
27-03	145.80	521.86	3600.00	51.38	1008.63	1.52	16.00	17.40
27-03	143.08	518.00	3600.00	45.32	1010.56	6.10	7.70	6.40
27-03	139.58	513.01	3600.00	37.52	1013.02	6.10	15.70	16.90
27-03	136.07	508.02	3600.00	-2.45	1021.36	6.10	9.50	9.00
27-03	132.57	503.03	3600.00	-11.32	1003.53	6.10	10.40	9.20
27-03	129.08	498.03	3600.00	-16.79	1002.21	6.10	18.80	20.50
27-03	125.17	492.40	3600.00	-22.32	995.15	4.57	10.90	10.10
27-03	122.39	488.39	3600.00	-29.90	983.56	3.35	16.80	18.00
27-03	119.01	483.51	3600.00	-39.13	969.45	6.10	21.00	23.50
27-03	115.53	478.50	3600.00	-48.62	954.95	6.10	18.00	18.60
27-03	112.05	473.49	3600.00	-58.11	940.45	6.10	15.00	16.80
27-03	108.58	468.48	3600.00	-67.58	925.97	6.10	17.40	17.90
27-03	105.11	463.47	3600.00	-77.05	911.49	6.10	14.40	11.90
27-03	101.63	458.47	3600.00	-84.43	899.90	6.10	25.40	28.00
27-03	99.20	454.96	3600.00	-87.32	864.18	2.44	16.50	17.00
27-03	92.02	444.73	3600.00	-110.96	789.53	6.10	15.40	16.80
27-03	88.43	439.81	3600.00	-121.59	783.09	6.10	15.00	15.20
27-03	84.84	434.88	3600.00	-132.22	776.65	6.10	21.60	24.90
27-03	81.25	429.95	3600.00	-142.86	770.21	6.10	27.40	34.30
27-03	77.66	425.02	3600.00	-153.49	763.77	6.10	25.90	30.90
27-03	74.07	420.10	3600.00	-164.12	757.34	6.10	19.50	27.40
27-03	70.48	415.17	3600.00	-174.75	750.90	6.10	23.00	28.30
27-03	66.89	410.24	3600.00	-185.38	744.46	6.10	18.50	21.80
27-03	63.30	405.32	3600.00	-196.01	738.03	6.10	27.10	32.20
27-03	59.71	400.39	3600.00	-206.64	731.59	6.10	26.70	31.90
27-03	56.03	395.34	3600.00	-217.54	724.99	6.40	25.10	30.30
27-03	52.35	390.29	3600.00	-228.44	718.40	6.10	18.50	20.60
27-03	48.76	385.36	3600.00	-239.07	711.96	6.10	23.30	26.00
27-03	45.17	380.44	3600.00	-249.70	705.52	6.10	24.30	25.90
27-03	43.01	377.48	3600.00	-256.09	701.65	1.22	9.80	8.30
27-03	24.53	352.11	3600.00	-313.67	581.63	6.10	27.20	35.00
27-03	21.10	347.06	3600.00	-325.94	571.69	6.10	36.50	44.60

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
27-03	18.50	342.94	3600.00	-335.57	563.75	3.66	37.70	49.50
27-03	17.04	340.62	3600.00	-340.99	559.29	1.83	13.80	16.70
27-03	16.14	339.20	3600.00	-344.31	556.55	1.52	11.30	9.90
27-03	14.11	335.98	3600.00	-351.84	550.35	6.10	43.20	58.80
27-03	10.86	330.83	3600.00	-363.87	540.43	6.10	42.90	58.90
27-03	7.60	325.67	3600.00	-375.94	530.49	6.10	40.80	54.30
27-03	4.35	320.52	3600.00	-387.97	520.57	6.10	38.10	49.50
27-03	1.10	315.36	3600.00	-400.02	510.64	6.10	39.40	52.30
27-03	-2.16	310.20	3600.00	-412.09	500.70	6.10	38.30	48.80
27-03	-4.27	306.85	3600.00	-416.24	491.60	1.83	25.00	30.00
035-2	-322.12	699.62	3600.00	-594.26	798.17	3.66	20.70	24.50
035-2	-324.63	695.44	3600.00	-603.80	791.28	6.10	25.60	31.30
035-2	-327.77	690.21	3600.00	-615.74	782.67	6.10	32.20	41.60
035-2	-330.91	684.99	3600.00	-627.67	774.06	6.10	27.50	36.00
035-2	-334.05	679.76	3600.00	-639.61	765.44	6.10	34.20	47.70
035-2	-337.19	674.54	3600.00	-651.53	756.84	6.10	36.00	48.60
035-2	-340.32	669.31	3600.00	-663.45	748.23	6.10	41.80	56.40
035-2	-346.88	659.03	3600.00	-687.70	730.97	6.10	31.00	40.50
035-2	-350.20	653.92	3600.00	-699.87	722.34	6.10	39.30	55.00
035-2	-353.52	648.81	3600.00	-712.04	713.71	6.10	22.90	31.80
035-2	-356.83	643.69	3600.00	-724.20	705.08	6.10	30.10	44.00
035-2	-360.16	638.58	3600.00	-768.93	596.25	6.10	34.80	50.00
035-2	-363.48	633.47	3600.00	-780.12	587.53	6.10	41.20	57.30
035-2	-366.80	628.36	3600.00	-791.30	578.80	6.10	44.30	61.70
035-2	-370.12	623.24	3600.00	-802.50	570.07	6.10	30.90	37.80
035-2	-373.44	618.13	3600.00	-813.68	561.35	6.10	34.80	43.30
035-2	-378.42	610.46	3600.00	-830.47	548.26	12.19	20.00	18.90
035-2	-383.40	602.79	3600.00	-847.25	535.17	6.10	32.80	42.70
035-2	-386.72	597.68	3600.00	-858.44	526.44	6.10	39.90	53.80
035-2	-390.04	592.57	3600.00	-869.63	517.72	6.10	37.80	49.60
035-2	-393.36	587.45	3600.00	-880.82	508.99	6.10	36.20	44.80
035-2	-395.85	583.62	3600.00	-889.21	502.45	3.05	15.00	17.50
035-3	-476.20	740.25	3600.00	-875.27	703.72	1.83	49.90	72.80
035-3	-478.75	737.21	3600.00	-915.39	598.76	6.10	38.00	51.60
035-3	-482.67	732.55	3600.00	-926.08	591.24	6.10	39.50	53.10
035-3	-485.80	728.81	3600.00	-934.64	585.22	3.66	32.20	39.20
035-3	-493.94	719.12	3600.00	-956.85	569.60	4.57	33.70	45.00
035-3	-506.72	703.39	3600.00	-992.06	544.60	3.66	43.40	56.00
035-3	-509.79	699.60	3600.00	-1000.53	538.58	6.10	36.30	49.00
035-3	-513.63	694.87	3600.00	-1011.11	531.07	6.10	42.10	59.70
035-3	-521.30	685.39	3600.00	-1032.27	516.03	6.10	32.20	44.70
035-3	-525.14	680.65	3600.00	-1042.86	508.51	6.10	25.70	33.50
035-3	-528.11	676.98	3600.00	-1051.05	502.69	3.35	37.40	50.30
040-1	762.52	538.27	3600.00	1324.56	505.01	6.10	24.90	30.10
040-1	758.68	533.53	3600.00	1318.05	520.51	6.10	35.70	49.20
040-1	754.84	528.79	3600.00	1311.54	536.01	6.10	35.20	46.00

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
040-1	751.01	524.06	3600.00	1305.04	551.47	6.10	30.70	41.00
040-1	747.17	519.32	3600.00	1298.77	564.53	6.10	19.50	23.90
040-1	742.38	513.40	3600.00	1292.06	578.23	3.05	26.20	36.70
040-1	739.50	509.85	3600.00	1288.03	586.47	6.10	17.00	20.20
040-1	735.66	505.11	3600.00	1235.54	672.47	6.10	13.90	16.00
040-1	731.83	500.37	3600.00	1216.50	701.50	6.10	24.70	31.30
040-1	727.99	495.63	3600.00	1210.25	701.70	6.10	25.10	31.70
040-1	724.15	490.90	3600.00	1204.00	701.90	6.10	20.90	24.70
040-1	720.51	486.40	3600.00	1137.98	701.14	5.49	30.80	39.00
040-1	716.86	481.89	3600.00	1132.35	701.57	6.10	20.10	24.50
040-1	713.03	477.16	3600.00	1126.44	702.02	6.10	18.80	22.20
040-1	709.96	473.37	3600.00	1152.37	631.38	3.66	14.00	14.10
040-1	706.89	469.58	3600.00	1151.79	590.77	6.10	18.00	20.70
040-1	703.01	464.87	3600.00	1134.47	576.68	6.10	17.80	20.00
040-1	699.09	460.20	3600.00	1117.10	562.61	6.10	25.00	30.50
040-1	695.18	455.53	3600.00	1099.77	548.55	6.10	28.30	37.00
040-1	691.16	450.75	3600.00	1082.80	534.35	6.40	27.70	34.30
040-1	687.83	446.78	3600.00	1068.84	523.25	3.96	20.60	25.60
040-1	684.69	443.04	3600.00	1055.69	512.79	5.79	35.50	45.40
040-1	682.15	440.01	3600.00	1045.04	504.32	2.13	15.40	17.60
040-1	679.60	436.97	3600.00	1039.87	395.90	5.79	10.40	11.10
040-1	677.15	434.05	3600.00	1035.03	391.10	1.83	37.00	50.60
040-1	659.01	412.68	3600.00	999.27	355.74	3.66	25.80	34.00
40-2A	471.19	651.12	3600.00	847.01	651.32	2.44	10.30	9.00
40-2A	466.89	643.05	3600.00	868.26	602.36	6.10	13.30	14.10
40-2A	464.03	637.66	3600.00	842.78	577.97	6.10	18.80	22.60
40-2A	461.17	632.28	3600.00	823.01	561.22	6.10	20.30	24.60
40-2A	458.19	627.33	3600.00	803.70	545.44	5.49	10.90	11.60
40-2A	454.91	622.56	3600.00	785.14	530.14	6.10	26.50	33.30
40-2A	452.49	619.04	3600.00	771.44	518.85	2.44	39.90	52.90
40-2A	450.68	616.41	3600.00	761.20	510.41	3.96	22.10	25.60
40-2A	448.43	613.14	3600.00	752.02	399.34	3.96	29.70	38.40
40-2A	431.25	588.14	3600.00	696.24	336.20	3.05	34.80	46.30
40-2A	405.72	554.15	3600.00	418.88	335.21	3.96	19.90	23.10
40-2A	379.60	519.84	3600.00	299.56	512.20	6.10	30.40	37.60
40-2A	375.60	515.23	3600.00	288.52	518.55	6.10	37.30	47.20
40-2A	372.60	511.78	3600.00	280.24	523.31	3.05	33.30	41.40
40-2A	370.60	509.49	3600.00	274.74	526.48	3.05	41.40	59.90
40-2A	367.60	506.03	3600.00	266.45	531.25	6.10	41.40	56.70
40-2A	363.40	501.20	3600.00	254.87	537.91	2.44	40.10	53.60
40-2A	362.00	499.59	3600.00	251.01	540.14	1.83	18.00	17.80
40-2A	359.10	496.26	3600.00	241.59	544.50	7.01	39.50	46.90
40-2A	353.40	489.70	3600.00	223.67	554.94	2.44	20.30	24.80
40-2A	351.40	487.40	3600.00	217.39	558.60	3.66	15.80	14.80
40-2A	348.10	483.60	3600.00	207.01	564.64	6.40	44.80	60.90
40-2A	343.89	479.00	3600.00	194.20	572.21	6.10	37.40	43.30

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
40-2A	339.65	474.61	3600.00	181.72	579.68	6.10	33.50	37.30
40-2A	335.42	470.23	3600.00	169.26	587.14	6.10	43.60	52.30
40-2A	330.76	465.40	3600.00	155.49	594.01	7.32	32.80	40.00
40-2A	310.64	444.57	3600.00	115.23	683.23	6.10	29.90	36.20
40-2A	306.41	440.19	3600.00	100.51	704.06	6.10	27.10	32.60
40-2A	301.99	436.00	3600.00	93.39	707.13	6.10	19.70	22.20
40-2A	297.39	432.00	3600.00	86.26	710.41	6.10	20.90	22.00
40-2A	292.79	428.00	3600.00	79.14	713.69	6.10	35.00	41.30
40-2A	288.19	424.00	3600.00	72.02	716.97	6.10	31.70	38.90
40-2A	283.59	420.00	3600.00	63.79	721.46	6.10	26.70	29.90
40-2A	278.99	416.00	3600.00	57.22	723.77	6.10	25.00	29.50
40-2A	275.65	413.10	3600.00	51.89	726.18	2.74	21.60	24.10
40-2A	266.57	405.20	3600.00	39.36	731.65	6.10	12.80	14.00
40-2A	261.96	401.20	3600.00	32.88	733.63	6.10	11.30	9.10
40-2A	256.06	396.39	3600.00	25.33	736.19	9.14	17.30	26.60
40-2A	249.10	390.95	3600.00	16.39	737.98	8.53	19.80	23.70
051-2	-95.79	689.26	3600.00	-144.15	1027.58	6.10	22.10	25.30
051-2	-97.79	684.01	3600.00	-298.81	1003.55	6.10	27.00	31.90
051-2	-99.31	680.10	3600.00	-303.25	995.58	3.05	22.80	26.40
051-2	-100.84	676.17	3600.00	-305.86	990.55	6.10	24.30	27.10
051-2	-102.87	670.95	3600.00	-309.31	983.87	6.10	24.20	26.80
051-2	-104.91	665.72	3600.00	-312.78	977.16	6.10	24.30	26.10
051-2	-106.94	660.50	3600.00	-316.23	970.48	6.10	23.40	25.20
051-2	-108.97	655.28	3600.00	-319.68	963.79	6.10	26.10	30.10
051-2	-111.00	650.05	3600.00	-323.13	957.10	6.10	23.10	24.40
051-2	-113.07	644.85	3600.00	-326.64	950.40	6.10	25.50	29.90
051-2	-115.16	639.68	3600.00	-330.17	943.71	6.10	25.40	28.90
051-2	-117.25	634.51	3600.00	-333.70	937.03	6.10	23.40	27.30
051-2	-119.34	629.34	3600.00	-338.92	930.48	6.10	24.20	29.10
051-2	-121.43	624.17	3600.00	-342.83	923.51	6.10	21.60	24.90
051-2	-123.52	619.00	3600.00	-346.74	916.53	6.10	21.50	24.50
051-2	-125.62	613.83	3600.00	-352.21	907.44	6.10	21.00	26.90
051-2	-127.71	608.66	3600.00	-355.91	900.74	6.10	23.40	28.00
051-2	-129.80	603.50	3600.00	-362.22	797.06	6.10	25.40	29.80
051-2	-131.89	598.32	3600.00	-369.86	791.77	6.10	25.40	29.30
051-2	-133.98	593.15	3600.00	-376.37	787.23	6.10	21.90	24.90
051-2	-136.07	587.98	3600.00	-382.89	782.69	6.10	15.60	17.50
051-2	-138.16	582.82	3750.00	-66.67	942.82	6.10	21.00	25.10
051-2	-140.26	577.65	3750.00	-76.45	938.37	6.10	22.50	26.20
051-2	-142.35	572.47	3750.00	-88.01	932.89	6.10	21.30	23.30
051-2	-144.44	567.31	3750.00	-97.56	928.56	6.10	22.50	24.20
051-2	-146.53	562.14	3750.00	-107.12	924.23	6.10	20.70	23.50
051-2	-148.62	556.97	3750.00	-116.68	919.89	6.10	26.30	32.60
051-2	-150.71	551.80	3750.00	-126.25	915.56	6.10	21.80	24.60
051-2	-152.81	546.63	3750.00	-135.81	911.22	6.10	20.00	22.30
051-2	-154.90	541.46	3750.00	-145.37	906.89	6.10	17.90	20.60

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
051-2	-156.46	537.58	3750.00	-152.55	903.63	3.05	29.40	36.60
051-2	-158.03	533.70	3750.00	-159.72	900.38	6.10	27.30	34.10
051-2	-160.13	528.53	3750.00	-163.83	875.33	6.10	13.80	13.70
051-2	-162.22	523.36	3750.00	-167.40	848.04	6.10	17.90	19.10
051-2	-164.31	518.19	3750.00	-190.49	792.47	6.10	10.70	10.80
051-2	-166.37	513.00	3750.00	-210.19	784.55	6.10	21.00	23.90
051-2	-168.40	507.77	3750.00	-229.90	776.61	6.10	26.10	30.40
051-2	-170.44	502.54	3750.00	-249.63	768.66	6.10	25.50	27.10
051-2	-180.19	477.46	3750.00	-342.49	730.43	5.49	36.30	46.40
051-2	-181.45	474.19	3750.00	-355.39	725.18	2.13	37.80	48.80
051-2	-182.98	470.10	3750.00	-371.42	718.64	6.10	43.70	61.30
051-2	-184.96	464.82	3750.00	-392.12	710.20	6.10	38.40	52.50
051-2	-186.83	459.80	3750.00	-411.77	702.17	5.49	34.70	46.50
051-2	-188.76	454.66	3750.00	-427.18	659.56	4.57	27.00	34.80
01-14	611.35	622.26	3750.00	1773.47	507.11	7.01	33.10	44.30
01-14	608.22	616.51	3750.00	1796.26	521.15	6.10	36.30	48.20
01-14	605.45	611.08	3750.00	1817.19	534.14	6.10	36.50	50.40
01-14	602.68	605.65	3750.00	1838.13	547.14	6.10	33.20	45.30
01-14	599.91	600.22	3750.00	1859.06	560.13	6.10	33.00	41.00
01-14	597.15	594.79	3750.00	1879.96	573.11	6.10	21.50	27.00
01-14	594.38	589.35	3750.00	1896.02	583.30	6.10	22.30	27.90
01-14	591.61	583.92	3750.00	1911.66	593.45	6.10	15.20	17.70
01-14	586.08	573.06	3750.00	1679.13	713.94	6.10	32.30	41.10
01-14	583.31	567.63	3750.00	1684.46	722.93	6.10	27.00	34.40
01-14	580.40	562.27	3750.00	1696.42	734.95	6.10	32.60	40.60
01-14	577.35	556.99	3750.00	1708.64	747.07	6.10	33.00	41.80
01-14	574.30	551.71	3750.00	1720.85	759.19	6.10	32.70	39.40
01-14	571.26	546.43	3750.00	1733.04	771.29	6.10	19.30	22.30
01-14	568.21	541.16	3750.00	1745.25	783.39	6.10	16.50	19.80
01-15	321.27	702.70	3750.00	1001.08	726.20	6.10	21.00	25.30
01-15	316.96	698.39	3750.00	977.10	681.38	6.10	34.60	42.90
01-15	312.65	694.08	3750.00	1074.77	638.93	6.10	38.60	44.80
01-15	308.34	689.77	3750.00	1155.98	603.52	6.10	38.30	50.90
01-15	305.10	686.53	3750.00	1109.27	581.61	3.05	43.20	59.60
01-15	299.83	681.26	3750.00	1023.28	552.85	6.40	33.90	40.60
08-09	-76.86	780.68	3750.00	463.46	758.64	6.10	17.50	18.90
08-09	-77.40	774.61	3750.00	455.21	759.66	6.10	17.50	17.20
08-09	-77.93	768.54	3750.00	446.96	760.67	6.10	18.20	19.60
08-09	-80.05	744.24	3750.00	409.77	766.40	6.10	22.00	24.90
08-09	-80.58	738.17	3750.00	401.32	767.50	6.10	16.90	19.50
08-09	-81.11	732.09	3750.00	392.85	768.60	6.10	20.20	22.40
08-09	-81.65	726.02	3750.00	384.39	769.71	6.10	19.80	20.40
08-09	-82.18	719.95	3750.00	371.01	772.40	6.10	18.60	20.10
08-09	-82.71	713.88	3750.00	361.84	773.76	6.10	20.20	23.60
08-09	-83.05	709.93	3750.00	355.87	774.64	1.83	18.30	19.00
24-08	498.75	660.70	3750.00	1988.87	621.51	6.10	15.00	16.20

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
24-08	496.11	657.55	3750.00	1899.99	655.73	2.13	17.90	21.10
24-08	491.51	652.06	3750.00	1804.18	716.78	5.49	29.10	37.10
24-08	487.78	647.63	3750.00	1818.78	730.99	6.10	26.00	32.00
24-08	483.87	642.96	3750.00	1834.12	745.94	6.10	30.50	38.90
24-08	479.79	638.43	3750.00	1849.66	760.86	6.10	34.30	43.80
24-08	476.40	634.92	3750.00	1862.22	772.76	3.66	24.10	29.60
24-08	473.12	631.53	3750.00	1874.36	784.25	5.79	26.50	32.40
24-08	454.17	611.90	3750.00	1339.44	885.95	1.83	20.10	24.10
24-08	450.04	607.63	3750.00	1341.71	851.00	2.74	18.70	22.30
24-08	447.71	605.21	3750.00	1343.00	831.23	3.96	11.90	13.10
24-08	445.06	602.47	3750.00	1344.45	808.80	3.66	18.10	20.70
24-08	441.68	598.96	3750.00	1316.77	788.76	6.10	16.30	18.90
24-08	437.40	594.61	3750.00	1265.54	768.40	6.10	20.50	24.60
24-08	433.52	590.74	3750.00	1219.56	750.14	4.88	19.40	22.90
24-08	428.35	585.56	3750.00	1158.14	725.75	7.32	22.20	25.90
24-08	422.86	580.07	3750.00	1093.53	699.90	6.40	19.80	23.70
24-08	419.30	576.51	3750.00	1219.53	646.74	3.66	17.70	19.20
24-08	415.85	573.06	3750.00	1298.13	589.28	6.10	27.40	34.70
24-08	411.39	568.68	3750.00	1222.64	564.30	6.40	36.80	47.40
24-08	406.24	563.71	3750.00	1135.99	535.65	3.66	42.60	54.00
24-08	402.62	560.21	3750.00	1075.04	515.50	6.40	35.60	43.80
27-02	-1.77	792.79	3750.00	530.93	717.12	6.10	37.20	47.60
27-02	-3.86	787.06	3750.00	523.23	729.47	6.10	26.40	31.90
27-02	-5.94	781.33	3750.00	513.22	731.44	6.10	21.40	24.70
27-02	-8.03	775.61	3750.00	503.23	733.41	6.10	18.40	22.80
27-02	-10.11	769.88	3750.00	493.22	735.37	6.10	25.20	28.90
27-02	-12.50	764.28	3750.00	483.21	737.43	6.10	20.10	21.30
27-02	-15.20	758.81	3750.00	474.10	738.91	6.10	26.70	32.10
27-02	-17.90	753.34	3750.00	464.29	741.00	6.10	21.80	26.20
27-02	-20.59	747.88	3750.00	454.49	743.08	6.10	22.50	26.00
27-02	-23.29	742.41	3750.00	444.67	745.17	6.10	25.50	29.60
27-02	-26.04	736.97	3750.00	437.72	747.10	6.10	22.30	26.10
27-02	-28.86	731.56	3750.00	427.26	749.48	6.10	21.50	23.80
27-02	-31.67	726.16	3750.00	416.83	751.84	6.10	19.40	21.30
27-02	-34.49	720.75	3750.00	406.38	754.22	6.10	15.90	18.00
27-02	-36.67	716.56	3750.00	396.41	756.24	3.35	18.40	20.10
27-02	-44.76	701.02	3750.00	367.12	762.87	6.10	22.70	28.50
27-02	-47.58	695.61	3750.00	356.92	765.19	6.10	22.00	25.60
27-02	-50.39	690.20	3750.00	346.73	767.50	6.10	22.20	26.30
27-02	-53.32	684.86	3750.00	336.56	769.84	6.10	19.70	22.20
27-02	-56.37	679.58	3750.00	326.41	772.21	6.10	23.70	29.60
27-02	-59.42	674.30	3750.00	316.25	774.59	6.10	28.60	36.00
27-02	-62.16	669.55	3750.00	307.11	776.72	4.88	26.90	31.20
27-02	-65.67	663.48	3750.00	295.43	779.46	6.10	23.10	27.60
27-02	-68.71	658.20	3750.00	285.28	781.83	6.10	25.00	28.50
27-02	-71.76	652.92	3750.00	275.13	784.20	6.10	28.40	34.40

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
27-02	-74.81	647.64	3750.00	260.40	788.53	6.10	27.80	33.80
27-02	-77.86	642.36	3750.00	249.55	791.15	6.10	24.00	28.00
27-02	-80.22	638.27	3750.00	241.14	793.17	3.35	24.70	27.20
27-02	-85.48	629.88	3750.00	200.33	799.90	6.10	23.50	25.50
27-02	-88.76	624.73	3750.00	200.13	799.90	6.10	15.80	18.50
27-02	-92.03	619.59	3750.00	175.14	907.32	6.10	20.00	23.20
27-02	-95.31	614.45	3750.00	165.29	909.42	6.10	21.00	25.60
27-02	-98.58	609.31	3750.00	153.15	912.56	6.10	16.40	19.30
27-02	-101.86	604.17	3750.00	142.27	915.16	6.10	22.20	26.20
27-02	-105.14	599.02	3750.00	131.38	917.76	6.10	21.10	25.10
27-02	-108.41	593.88	3750.00	120.52	920.35	6.10	26.30	32.30
27-02	-111.68	588.74	3750.00	109.66	922.94	6.10	21.40	25.80
27-02	-114.96	583.60	3750.00	98.77	925.54	6.10	24.80	29.60
27-02	-118.45	578.62	3750.00	87.55	928.37	6.10	24.40	28.80
27-02	-122.17	573.78	3750.00	-70.96	930.74	6.10	36.40	49.30
27-02	-125.88	568.94	3750.00	-81.25	926.95	6.10	28.10	35.40
27-02	-129.59	564.10	3750.00	-91.53	923.17	6.10	33.80	43.10
27-02	-134.23	558.06	3750.00	-107.36	916.48	9.14	20.70	24.50
27-02	-138.86	552.01	3750.00	-119.69	912.09	6.10	18.20	20.80
27-02	-142.57	547.18	3750.00	-129.55	908.58	6.10	32.40	42.20
27-02	-146.29	542.34	3750.00	-139.42	905.07	6.10	27.50	34.70
27-02	-149.90	537.63	3750.00	-149.03	901.65	5.79	21.60	25.90
27-02	-152.27	534.45	3750.00	-153.58	900.69	2.13	7.30	5.70
27-02	-154.58	531.05	3750.00	-153.28	903.25	6.10	15.30	18.00
27-02	-158.02	526.01	3750.00	-162.59	856.38	6.10	21.80	27.50
27-02	-161.45	520.97	3750.00	-167.40	832.29	6.10	27.70	34.90
27-02	-164.88	515.93	3750.00	-197.97	789.34	6.10	33.00	40.80
27-02	-168.31	510.89	3750.00	-221.91	780.27	6.10	33.20	42.50
27-02	-171.74	505.85	3750.00	-245.85	771.21	6.10	34.00	41.60
27-02	-175.17	500.81	3750.00	-269.79	762.14	6.10	40.20	52.30
27-02	-178.60	495.77	3750.00	-293.73	753.08	6.10	38.10	49.30
27-02	-182.03	490.74	3750.00	-317.65	744.02	6.10	30.20	37.10
27-02	-185.46	485.70	3750.00	-341.59	734.96	6.10	39.20	50.70
27-02	-188.74	480.57	3750.00	-365.25	725.93	6.10	39.20	49.70
27-02	-191.89	475.34	3750.00	-388.71	716.92	6.10	37.00	45.20
27-02	-194.32	471.29	3750.00	-406.86	709.95	3.35	33.10	41.40
27-02	-202.40	457.83	3750.00	-449.25	632.95	6.10	43.90	57.00
27-02	-205.54	452.61	3750.00	-475.32	586.97	6.10	26.20	31.00
27-02	-208.68	447.39	3750.00	-496.00	572.23	6.10	26.20	31.00
27-02	-211.82	442.16	3750.00	-516.71	557.48	6.10	39.10	55.10
27-02	-214.96	436.93	3750.00	-537.41	542.73	6.10	33.30	42.20
27-02	-218.10	431.71	3750.00	-558.10	528.00	6.10	34.30	40.10
27-02	-221.24	426.48	3750.00	-578.80	513.25	6.10	36.40	44.10
27-02	-223.36	422.96	3750.00	-592.76	503.30	2.13	13.00	14.10
28-04	700.34	526.88	3750.00	1626.91	503.24	6.10	27.10	33.80
28-04	695.90	522.71	3750.00	1655.69	518.48	6.10	34.20	46.50

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
28-04	691.34	518.67	3750.00	1684.74	533.76	6.10	35.60	46.70
28-04	686.43	514.32	3750.00	1716.01	550.22	7.01	25.90	33.40
28-04	678.78	507.56	3750.00	1764.69	575.83	6.10	22.50	28.70
28-04	674.33	503.62	3750.00	1793.03	590.73	5.79	16.70	19.10
28-04	667.14	497.26	3750.00	1564.53	707.74	5.49	30.60	38.60
28-04	662.80	493.42	3750.00	1577.14	720.46	6.10	23.10	27.80
28-04	658.24	489.38	3750.00	1590.40	733.84	6.10	32.00	41.50
28-04	653.59	485.45	3750.00	1603.69	747.10	6.10	36.60	47.60
28-04	648.85	481.61	3750.00	1617.05	760.28	6.10	37.40	45.90
28-04	644.11	477.77	3750.00	1630.40	773.47	6.10	21.50	25.00
28-04	639.37	473.93	3750.00	1643.75	786.65	6.10	24.40	28.80
28-04	635.70	470.96	3750.00	1637.80	809.80	3.35	19.70	22.30
28-04	632.74	468.56	3750.00	1631.97	811.49	.61	18.50	21.00
28-04	631.08	467.22	3750.00	1647.45	809.37	1.22	17.00	19.80
28-04	620.31	458.50	3750.00	1554.61	812.42	7.62	22.50	28.50
28-04	614.98	454.18	3750.00	1527.07	782.74	6.10	25.30	31.40
28-04	610.95	450.92	3750.00	1499.21	771.81	4.27	34.70	39.80
28-04	606.26	446.80	3750.00	1465.21	758.37	5.79	25.50	31.40
28-04	601.98	442.67	3750.00	1432.40	745.27	6.10	27.30	35.00
28-04	597.60	438.43	3750.00	1397.21	731.49	6.10	23.30	27.40
28-04	594.20	435.15	3750.00	1368.48	720.02	3.35	25.40	31.10
28-04	591.68	432.71	3750.00	1347.15	711.51	1.83	36.00	47.80
28-04	583.57	424.88	3750.00	1535.20	605.85	6.10	30.30	39.60
28-04	569.97	411.75	3750.00	1351.11	534.47	2.44	.00	38.30
30-03	-368.24	706.93	3750.00	-331.36	946.68	7.62	29.50	38.90
30-03	-372.65	701.68	3750.00	-439.72	860.64	6.10	24.60	28.80
30-03	-375.58	698.18	3750.00	-442.76	846.60	3.05	34.40	45.20
30-03	-398.11	671.33	3750.00	-563.71	757.07	6.10	41.00	57.00
30-03	-402.03	666.65	3750.00	-591.08	746.60	6.10	52.40	70.30
30-03	-405.95	661.98	3750.00	-618.42	736.19	6.10	68.00	91.80
30-03	-419.57	645.56	3750.00	-712.66	700.25	7.32	45.40	61.10
30-03	-432.98	628.39	3750.00	-779.96	579.53	5.18	36.60	45.80
30-03	-436.45	623.94	3750.00	-805.35	560.25	6.10	43.00	58.30
30-03	-440.21	619.14	3750.00	-832.79	539.44	6.10	35.90	44.20
30-03	-443.49	614.93	3750.00	-856.80	521.21	4.57	35.10	46.20
051-1	339.69	688.88	3750.00	1083.50	749.73	2.44	16.40	18.00
051-1	336.89	685.71	3750.00	1045.12	734.33	4.27	17.90	20.40
051-1	333.47	681.85	3750.00	998.30	715.54	6.10	16.20	18.20
051-1	329.46	677.32	3750.00	1009.06	678.24	6.10	16.70	20.40
051-1	325.45	672.79	3750.00	1123.82	627.81	6.10	14.60	16.10
051-1	321.04	667.81	3750.00	1131.00	581.06	4.88	22.70	27.50
051-1	317.42	663.73	3750.00	1093.19	567.93	6.10	18.90	21.20
051-1	313.41	659.20	3750.00	1025.56	544.84	6.10	33.80	42.50
051-1	309.40	654.67	3750.00	957.93	521.76	6.10	36.20	42.10
051-1	305.39	650.14	3750.00	896.28	399.90	6.10	31.80	41.00
051-1	301.37	645.61	3750.00	891.01	399.90	6.10	21.50	26.20

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
051-1	297.36	641.08	3750.00	879.21	398.76	6.10	13.40	14.50
051-1	241.98	578.56	3750.00	388.16	530.59	2.44	15.00	16.40
051-1	239.18	575.39	3750.00	381.01	538.00	6.10	38.30	51.40
051-1	235.16	570.86	3750.00	370.77	548.61	6.10	37.10	47.10
051-1	231.15	566.33	3750.00	360.55	559.21	6.10	38.00	49.10
051-1	227.14	561.80	3750.00	351.10	568.71	6.10	26.40	30.90
051-1	223.12	557.27	3750.00	342.09	577.57	6.10	25.70	25.40
051-1	219.11	552.74	3750.00	333.09	586.40	6.10	16.80	18.50
051-1	215.10	548.21	3750.00	310.04	635.84	6.10	33.90	43.80
051-1	211.59	544.25	3750.00	297.80	673.58	4.57	36.00	41.70
051-1	198.75	529.75	3750.00	262.65	707.21	5.18	30.50	40.00
051-1	195.04	525.56	3750.00	253.39	709.46	6.10	30.60	38.50
051-1	191.03	521.03	3750.00	243.38	711.88	6.10	25.20	30.10
051-1	187.01	516.50	3750.00	233.36	714.32	6.10	35.60	44.70
051-1	184.00	513.10	3750.00	225.85	716.14	3.05	32.40	41.40
051-1	180.99	509.71	3750.00	218.35	717.96	6.10	38.70	50.50
051-1	176.98	505.18	3750.00	208.35	720.38	6.10	34.40	45.80
051-1	172.97	500.64	3750.00	198.33	722.81	6.10	31.80	40.60
051-1	168.95	496.11	3750.00	188.31	725.24	6.10	28.10	35.40
051-1	164.94	491.58	3750.00	178.30	727.67	6.10	20.30	24.50
051-1	160.93	487.06	3750.00	168.31	730.10	6.10	18.30	21.70
051-1	156.92	482.53	3750.00	158.30	732.52	6.10	19.10	23.60
051-1	152.90	477.99	3750.00	148.27	734.96	6.10	13.10	14.00
051-1	148.89	473.46	3750.00	138.26	737.38	6.10	27.50	35.90
051-1	144.88	468.93	3750.00	125.23	740.73	6.10	33.00	43.50
051-1	140.87	464.40	3750.00	114.20	743.09	6.10	11.40	12.60
051-1	136.86	459.87	3750.00	104.75	745.27	6.10	18.30	21.60
051-1	133.04	455.57	3750.00	95.77	747.36	5.49	31.40	39.30
051-1	128.63	450.59	3750.00	85.38	749.76	5.49	33.00	41.40
051-1	119.90	440.73	3750.00	64.81	754.52	4.57	35.40	47.90
051-1	112.08	431.90	3750.00	21.36	753.59	2.13	38.40	55.00
051-1	90.21	407.21	3750.00	-23.58	743.63	7.62	16.40	17.90
051-1	78.27	393.73	3750.00	-48.65	736.97	.61	49.20	71.00
035-1	-309.37	754.29	3915.30	-398.66	938.79	2.74	32.10	36.20
035-1	-311.24	750.29	3915.30	-405.39	935.60	6.10	24.50	27.60
035-1	-313.82	744.76	3915.30	-414.68	931.20	6.10	37.70	46.60
035-1	-316.39	739.24	3915.30	-423.94	926.80	6.10	41.90	53.30
035-1	-318.97	733.71	3915.30	-433.23	922.40	6.10	43.90	58.30
035-1	-321.55	728.19	3915.30	-439.31	919.12	6.10	28.30	32.60
035-1	-324.12	722.66	3915.30	-449.15	914.49	6.10	37.10	51.10
035-1	-326.70	717.14	3915.30	-458.99	909.85	6.10	32.80	45.50
035-1	-329.27	711.62	3915.30	-468.82	905.22	6.10	40.20	54.30
035-1	-331.85	706.09	3915.30	-477.75	899.90	6.10	12.60	14.60
035-1	-334.43	700.56	3915.30	-481.14	898.93	6.10	47.10	59.10
035-1	-337.00	695.04	3915.30	-481.50	797.91	6.10	58.60	76.20
035-1	-339.58	689.52	3915.30	-483.71	791.31	6.10	26.60	31.70

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
035-1	-342.16	683.99	3915.30	-485.93	784.71	6.10	34.70	42.50
035-1	-344.73	678.46	3915.30	-488.13	778.11	6.10	47.10	61.00
035-1	-347.31	672.94	3915.30	-490.34	771.52	6.10	46.20	59.10
035-1	-349.88	667.41	3915.30	-492.54	764.92	6.10	43.60	56.70
035-1	-359.94	645.21	3915.30	-501.08	738.61	6.10	44.30	61.30
035-1	-362.03	639.49	3915.30	-502.70	732.17	6.10	40.60	56.70
035-1	-364.11	633.76	3915.30	-504.31	725.73	6.10	35.00	46.60
035-1	-366.20	628.03	3915.30	-505.93	719.28	6.10	42.10	59.70
035-1	-368.29	622.30	3915.30	-507.55	712.83	6.10	33.90	45.50
035-1	-370.37	616.57	3915.30	-508.69	708.81	6.10	44.80	62.10
035-1	-372.45	610.84	3915.30	-532.25	598.87	6.10	54.30	75.50
035-1	-374.54	605.12	3915.30	-543.83	575.11	6.10	49.60	66.20
035-1	-376.62	599.39	3915.30	-555.39	551.35	6.10	43.70	56.90
035-1	-377.94	595.81	3915.30	-562.66	536.45	1.52	20.00	24.70
26-06	-250.20	762.34	3915.30	-269.11	974.93	6.40	27.90	34.40
26-06	-254.62	757.92	3915.30	-281.48	970.13	6.10	32.30	42.80
26-06	-258.93	753.61	3915.30	-293.53	965.45	6.10	21.80	26.80
26-06	-263.24	749.30	3915.30	-305.59	960.76	6.10	26.90	34.30
26-06	-267.55	744.99	3915.30	-317.65	956.08	6.10	30.50	40.50
26-06	-271.86	740.68	3915.30	-329.70	951.40	6.10	34.90	47.50
26-06	-276.17	736.37	3915.30	-341.76	946.72	6.10	35.80	49.00
26-06	-280.48	732.06	3915.30	-353.82	942.04	6.10	29.50	40.30
26-06	-310.16	701.40	3915.30	-437.47	909.29	6.10	45.00	62.70
26-06	-313.12	698.33	3915.30	-445.82	906.02	2.44	34.10	44.20
26-06	-318.63	692.63	3915.30	-461.43	824.62	6.10	46.10	56.80
26-06	-322.86	688.25	3915.30	-464.61	801.13	6.10	57.80	76.70
26-06	-335.94	675.47	3915.30	-477.58	781.40	6.10	50.30	66.10
26-06	-344.71	667.00	3915.30	-486.52	768.04	6.10	49.50	68.50
26-06	-366.64	645.83	3915.30	-508.90	734.64	6.10	35.20	47.00
26-06	-371.02	641.59	3915.30	-513.36	727.96	6.10	27.50	36.00
26-06	-384.52	621.38	3915.30	-526.14	701.09	6.10	49.20	68.40
26-06	-387.75	616.21	3915.30	-558.30	580.01	6.10	51.20	72.40
26-06	-390.99	611.04	3915.30	-571.65	555.32	6.10	34.00	41.60
27-01	-32.97	799.78	3915.30	467.68	784.82	6.10	38.20	49.40
27-01	-35.74	794.35	3915.30	462.12	785.98	6.10	38.20	50.70
27-01	-38.51	788.92	3915.30	456.55	787.15	6.10	37.70	49.90
27-01	-41.27	783.49	3915.30	450.99	788.31	6.10	31.90	41.10
27-01	-44.04	778.06	3915.30	445.43	789.38	6.10	29.30	38.90
27-01	-46.81	772.63	3915.30	436.64	799.90	6.10	31.00	40.10
27-01	-49.57	767.19	3915.30	430.82	799.90	6.10	20.80	21.40
27-01	-52.34	761.76	3915.30	417.28	859.14	6.10	19.80	20.00
27-01	-55.11	756.33	3915.30	378.97	909.79	6.10	12.70	12.80
27-01	-57.88	750.90	3915.30	352.62	918.10	6.10	21.40	24.70
27-01	-61.01	745.69	3915.30	324.54	927.20	6.10	13.90	14.70
27-01	-64.51	740.69	3915.30	283.45	941.36	6.10	17.90	20.10
27-01	-68.00	735.70	3915.30	248.99	953.00	6.10	20.50	23.70

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
27-01	-71.50	730.70	3915.30	214.46	964.67	6.10	28.60	38.60
27-01	-75.00	725.71	3915.30	194.03	970.86	6.10	30.20	39.30
27-01	-78.49	720.72	3915.30	171.60	978.17	6.10	32.80	40.70
27-01	-81.99	715.73	3915.30	138.95	988.21	6.10	40.10	52.80
27-01	-85.49	710.73	3915.30	108.76	998.12	6.10	32.80	43.10
27-01	-88.98	705.74	3915.30	.00	.00	6.10	31.00	39.40
27-01	-92.48	700.74	3915.30	.00	.00	6.10	16.50	18.10
27-01	-112.85	670.37	3915.30	-58.19	999.90	6.10	15.70	17.50
27-01	-116.24	665.30	3915.30	-60.07	999.90	6.10	23.50	28.00
27-01	-119.63	660.23	3915.30	-61.94	999.90	6.10	19.80	22.00
27-01	-123.02	655.16	3915.30	-82.21	984.18	6.10	25.10	32.20
27-01	-125.72	651.11	3915.30	-90.13	980.62	3.66	32.80	42.90
27-01	-128.62	647.18	3915.30	-98.38	977.01	6.10	30.70	37.80
27-01	-132.37	642.38	3915.30	-108.89	972.50	6.10	21.60	23.80
27-01	-136.12	637.58	3915.30	-119.39	967.99	6.10	18.90	20.20
27-01	-138.94	633.97	3915.30	-128.59	963.93	3.05	15.70	17.50
27-01	-141.75	630.37	3915.30	-136.27	960.62	6.10	35.10	43.40
27-01	-145.51	625.57	3915.30	-146.54	956.20	6.10	35.00	44.40
27-01	-149.26	620.77	3915.30	-156.78	951.78	6.10	36.90	46.70
27-01	-152.07	617.16	3915.30	-164.47	948.47	3.05	28.10	33.90
27-01	-154.89	613.56	3915.30	-172.17	945.15	6.10	18.50	19.50
27-01	-157.70	609.95	3915.30	-179.86	941.83	3.05	24.10	29.10
27-01	-160.52	606.35	3915.30	-187.56	938.52	6.10	23.40	27.40
27-01	-164.51	601.76	3915.30	-198.03	934.15	6.10	24.80	29.90
27-01	-168.75	597.37	3915.30	-208.74	929.81	6.10	15.00	15.00
27-01	-172.98	592.99	3915.30	-219.43	925.48	6.10	21.70	24.30
27-01	-177.22	588.60	3915.30	-230.15	921.14	6.10	34.70	43.60
27-01	-181.45	584.22	3915.30	-240.84	916.81	6.10	35.00	43.80
27-01	-185.69	579.83	3915.30	-251.56	912.47	6.10	30.40	37.70
27-01	-189.92	575.45	3915.30	-262.25	908.14	6.10	22.90	26.50
27-01	-201.56	563.39	3915.30	-293.75	812.50	6.10	27.80	34.90
27-01	-205.80	559.01	3915.30	-297.92	796.05	6.10	39.20	54.10
27-01	-210.07	554.66	3915.30	-305.70	785.63	6.10	35.20	47.60
27-01	-214.38	550.34	3915.30	-310.19	779.30	6.10	28.40	35.70
27-01	-218.69	546.03	3915.30	-314.68	772.98	6.10	30.80	39.20
27-01	-223.00	541.73	3915.30	-319.17	766.66	6.10	31.40	41.60
27-01	-227.31	537.42	3915.30	-323.51	760.46	6.10	33.40	44.20
27-01	-231.62	533.11	3915.30	-328.01	754.12	6.10	38.60	50.40
27-01	-235.94	528.79	3915.30	-332.53	747.77	6.10	44.60	61.50
27-01	-240.25	524.48	3915.30	-337.03	741.43	6.10	45.10	62.40
27-01	-244.56	520.17	3915.30	-341.54	735.10	6.10	42.80	58.50
27-01	-248.87	515.86	3915.30	-346.04	728.76	6.10	45.10	61.40
27-01	-253.14	511.52	3915.30	-350.50	722.42	6.10	58.20	82.60
27-01	-257.38	507.13	3915.30	-354.91	716.06	6.10	38.90	49.60
27-01	-261.61	502.74	3915.30	-359.32	709.70	6.10	44.60	59.80
27-01	-265.21	499.02	3915.30	-363.07	704.30	4.27	17.50	14.10

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
27-01	-267.75	496.38	3915.30	-365.71	700.48	3.05	12.80	7.90
27-01	-270.50	493.54	3915.30	-398.93	593.30	4.88	30.70	37.80
27-01	-274.31	489.59	3915.30	-409.57	573.10	6.10	38.50	47.80
27-01	-277.81	485.97	3915.30	-419.33	554.58	3.96	40.80	53.00
27-01	-281.62	482.02	3915.30	-429.96	534.39	1.52	44.70	57.60
27-01	-284.90	478.63	3915.30	-439.11	517.04	6.10	44.50	59.60
27-01	-289.03	474.35	3915.30	-451.16	392.47	5.79	40.10	51.30
00016	103.95	772.96	3915.30	446.81	700.20	5.79	24.50	28.90
00016	99.75	768.76	3915.30	441.72	704.45	6.10	25.30	30.30
00016	95.44	764.45	3915.30	429.21	705.07	6.10	33.40	41.70
00016	90.69	759.70	3915.30	431.79	700.99	7.32	36.70	44.20
00016	83.37	752.38	3915.30	422.03	710.32	7.32	32.40	37.30
00016	76.36	745.37	3915.30	416.25	708.44	7.01	37.30	41.90
00016	71.73	740.74	3915.30	409.91	715.01	6.10	35.60	38.90
00016	67.42	736.43	3915.30	404.00	721.13	6.10	37.80	46.60
00016	61.92	730.93	3915.30	396.47	728.94	9.45	20.40	21.70
00016	55.46	724.47	3915.30	386.98	736.68	8.84	32.20	40.60
00016	49.10	718.11	3915.30	378.56	745.57	9.14	28.30	31.20
00016	43.71	712.72	3915.30	371.43	753.09	6.10	37.10	47.50
00016	37.24	706.25	3915.30	362.88	762.13	6.10	43.70	58.60
00016	32.93	701.94	3915.30	357.17	768.15	6.10	38.70	51.30
00016	28.62	697.63	3915.30	351.47	774.17	6.10	37.30	49.00
00016	24.31	693.32	3915.30	345.77	780.19	6.10	36.10	50.10
00016	20.00	689.01	3915.30	340.00	785.27	6.10	38.10	52.50
00016	16.02	685.03	3915.30	335.12	790.28	5.18	37.90	51.30
049-2	328.14	708.27	3923.48	916.55	758.98	3.35	35.50	45.50
049-2	326.81	705.82	3925.06	899.15	753.97	3.05	35.80	45.90
049-2	325.55	703.49	3926.56	882.62	749.21	3.05	38.80	49.90
049-2	324.30	701.16	3928.06	866.15	744.46	3.05	33.10	42.30
049-2	323.04	698.82	3929.56	849.58	739.68	3.05	19.80	22.60
049-2	321.78	696.48	3931.06	833.02	734.91	3.05	23.60	28.40
049-2	320.52	694.15	3932.56	816.49	730.15	3.05	21.20	26.60
049-2	319.26	691.81	3934.06	799.92	725.38	3.05	18.90	22.90
049-2	318.00	689.48	3935.56	803.60	725.92	3.05	12.50	12.40
049-2	316.87	687.38	3936.91	789.96	721.96	2.44	16.80	20.20
049-2	297.72	656.41	3959.73	681.19	619.05	3.05	17.60	21.00
049-2	296.36	654.21	3961.36	678.14	611.39	3.05	20.90	23.10
049-2	294.31	650.92	3963.79	671.57	598.06	6.10	34.90	44.00
049-2	292.00	647.20	3966.55	661.01	586.09	4.27	36.50	49.30
049-2	243.31	574.05	4024.58	1347.67	643.58	4.57	34.60	45.30
049-2	240.76	570.48	4027.61	1345.27	634.42	6.10	37.30	50.00
049-2	237.84	566.40	4031.09	1342.51	623.95	6.10	38.80	52.70
049-2	234.93	562.32	4034.56	1341.47	618.22	6.10	36.50	46.90
049-2	232.02	558.24	4038.03	1338.93	608.82	6.10	36.70	48.30
049-2	229.69	554.98	4040.80	1332.55	592.93	3.66	41.60	56.30
049-2	220.35	541.97	4051.93	1323.73	558.49	6.10	34.90	44.40

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
049-2	217.39	537.97	4055.46	1318.72	543.18	6.10	39.10	52.40
049-2	214.44	533.97	4058.98	1313.73	527.89	6.10	39.80	53.40
049-2	211.48	529.97	4062.51	1308.71	512.58	6.10	32.60	45.60
049-2	208.52	525.97	4066.03	1290.00	498.41	6.10	36.50	53.30
042-3	-96.22	769.19	4067.70	907.55	542.74	6.10	30.80	40.20
042-3	-99.98	764.39	4067.70	904.46	537.16	6.10	35.00	45.40
042-3	-103.73	759.58	4067.70	901.38	531.58	6.10	37.70	51.80
042-3	-107.48	754.78	4067.70	898.30	526.01	6.10	38.00	48.30
042-3	-110.77	750.58	4067.70	895.60	521.12	4.57	29.50	37.70
042-3	-122.68	735.33	4067.70	849.24	504.37	6.10	46.30	65.00
042-3	-126.68	730.73	4067.70	864.43	498.00	6.10	59.20	84.30
042-3	-130.91	726.35	4067.70	855.55	497.92	6.10	39.80	54.70
042-3	-135.15	721.96	4067.70	828.39	495.89	6.10	37.90	53.10
042-3	-139.38	717.58	4067.70	548.36	499.90	6.10	37.10	50.10
042-3	-142.66	714.18	4067.70	548.35	499.90	3.35	33.90	44.40
048-2	-38.84	778.43	4068.70	965.88	568.60	4.57	40.10	54.50
049-2	205.56	521.97	4069.56	1205.23	489.16	6.10	23.60	29.70
048-3	192.20	738.80	4069.84	787.15	843.51	2.44	38.50	51.90
048-2	-40.53	774.68	4070.71	965.01	565.40	4.57	38.80	53.50
048-3	191.19	736.56	4071.05	828.34	811.20	3.05	35.60	46.60
048-3	190.07	734.06	4072.39	819.89	819.66	3.05	37.50	51.40
048-2	-42.21	770.94	4072.72	964.15	562.21	4.57	35.80	46.50
049-2	202.61	517.97	4073.08	1120.58	479.92	6.10	17.90	22.10
048-3	188.94	731.57	4073.73	909.31	782.57	3.05	21.10	23.80
048-2	-43.90	767.19	4074.73	963.28	559.01	4.57	31.40	39.70
048-3	187.82	729.07	4075.07	935.24	775.92	3.05	33.80	45.10
048-3	186.69	726.57	4076.41	961.40	769.21	3.05	31.30	42.30
049-2	199.65	513.97	4076.60	1035.80	470.67	6.10	25.90	33.80
048-2	-45.87	762.82	4077.07	962.27	555.28	6.10	34.60	45.10
048-3	185.57	724.07	4077.74	987.32	762.56	3.05	34.40	44.30
51-3A	391.23	673.56	4078.15	2115.67	626.94	5.49	20.80	25.20
048-3	184.34	721.33	4079.22	1015.80	755.26	3.66	28.40	36.00
048-2	-48.11	757.83	4079.75	961.12	551.02	6.10	34.30	43.50
049-2	196.63	510.10	4080.21	951.92	461.53	6.10	32.80	46.20
048-2	-50.36	752.83	4082.43	959.97	546.75	6.10	36.50	44.70
049-2	193.54	506.34	4083.89	868.58	452.47	6.10	32.60	46.50
048-2	-52.61	747.84	4085.11	958.81	542.49	6.10	39.70	52.80
049-2	190.45	502.59	4087.57	785.68	443.50	6.10	31.10	42.20
048-2	-54.86	742.85	4087.79	957.66	538.23	6.10	35.50	45.60
048-2	-57.17	737.93	4090.55	956.43	534.01	6.10	29.60	35.90
049-2	187.52	499.02	4091.06	708.71	435.11	5.49	39.10	54.40
048-2	-59.56	733.10	4093.39	955.10	529.84	6.10	19.20	15.70
048-2	-61.94	728.26	4096.24	953.78	525.66	6.10	45.10	63.00
048-2	-64.33	723.42	4099.08	952.46	521.48	6.10	49.20	72.60
048-2	-66.71	718.59	4101.92	951.14	517.31	6.10	51.00	76.50
049-2	178.02	487.48	4102.38	459.43	407.96	5.79	25.30	33.40

HOLE ID	NORTHING	ELEV.	EASTING	UNFOLDED X(ALONG)	UNFOLDED Y(ACROSS)	LENGTH	Fe	WREC
51-3A	369.81	622.15	4103.68	1910.56	684.55	6.10	34.00	42.50
048-2	-69.10	713.75	4104.76	949.82	513.13	6.10	36.10	50.70
048-3	162.88	681.30	4104.79	1207.24	627.16	1.83	18.60	23.80
51-3A	368.21	618.31	4105.59	1895.92	688.64	3.05	30.10	39.30
049-2	175.01	483.82	4105.97	380.42	398.07	6.10	28.30	40.80
048-3	161.25	678.27	4106.74	1204.99	620.86	6.10	28.50	37.60
51-3A	366.61	614.48	4107.50	1881.30	692.72	6.10	29.60	39.00
048-2	-71.48	708.92	4107.60	934.42	505.76	6.10	28.90	37.50
049-2	171.95	480.03	4109.62	369.71	395.01	6.10	24.50	30.30
048-3	158.73	673.60	4109.74	1203.55	610.52	6.10	33.40	45.90
51-3A	364.42	609.43	4110.11	1861.83	698.19	6.10	27.30	35.20
048-3	156.21	668.93	4112.74	1200.27	593.16	6.10	39.60	55.10
51-3A	362.17	604.43	4112.79	1630.48	753.46	6.10	17.20	21.00
049-2	168.98	476.29	4113.16	359.18	391.98	5.79	29.30	36.50
51-3A	359.92	599.44	4115.47	1483.05	787.92	6.10	24.60	32.00
048-3	153.69	664.26	4115.74	1197.66	579.85	6.10	31.60	41.90
51-3A	357.67	594.45	4118.14	1263.22	915.78	6.10	21.00	25.50
049-2	164.71	470.92	4118.24	344.05	387.64	1.52	28.40	40.00
048-3	151.17	659.59	4118.74	1195.04	566.54	6.10	32.90	40.90
049-2	162.81	468.52	4120.51	337.29	385.70	6.10	27.70	37.30
51-3A	355.42	589.45	4120.82	1240.65	925.15	6.10	34.10	45.70
048-3	148.65	654.92	4121.74	1192.42	553.23	6.10	32.30	41.20
51-3A	353.18	584.46	4123.50	1209.65	937.94	6.10	27.00	33.50